INTERSTATE MEDICAL JOURNAL.

Vol. XV. FEBRUARY, 1908. No. 2

EDITORIAL.

A CONTEMNER OF THOSE GALLIPOT FELLOWS.

Heine says that there is no man so crazy that he may not find a crazier comrade who will understand him; and though Mrs. Eddy does not preface her book by this witticism of the German Aristophanes, our recent perusal of that product of consummate periphrasis, "Science and Health," impels us to suggest that all future editions should flamboyantly carry the German poet's dictum. We feel that, in this respect, a grievous fault has been committed against the "lesser man," the being of small brains and weak understanding, for communities need him with his bread and tea sanities as much as they require the presence of the somewhat frantic enthusiasts of rampant intellectual ideas; in fact, in the economy of nature his position has been adjudged of the greatest importance by some of the gravest philosophers of today. And just because he represents the element which needs a strong hand for its uplift on account of hereditary traits peculiar to mental Under-work on the part of his ancestors, we feel that he might become the ready prey to the wiles of the subversive teachings of Christian Science. For "Science and Health," as interpreted by us, has, for the matrix of belief, the spiritual and medical analeptic that is soothing to those who live apart from the maelstrom of revolutionary upheavals, be they philosophical, theological or medical; to those whose theories are pieced together out of narrow social conditions, fragments of medicine imperfectly understood, and reasonings on small experiences. Moreover, who will gainsay the illimitable power of a modern St. Catherine of Siena, whose admirers think she has been annointed to wrestle with all manner of diseases such as consumption, which can be cured since there are no lungs to become tuberculous; small-pox, "mortal mind not matter contains and carries infection"; leprosy; cancer, which cannot withstand "such powerful eloquence as a legislator would employ to defeat the passage of an inhuman law"; malformed limbs, "as directly the action of mortal error as insanity"; and the loss of a human limb which can be replaced "as readily as the lobster's claw,—not with an artificial limb, but with the genuine one."

Thus we have before us a book that teems with the happiest solutions of the most difficult problems which science has in vain tried to combat. As the world is constituted today—by which we mean the stress, the storm, the exasperating energy of our people—the man or woman, who sees fit to launch a message that is not weighted down by esoteric abstractions but is characterized by the child-like simplicity of the tenets of Christian Science, is sure to win an audience. Though the science of medicine is an open book to him who brings the proper appreciation and understanding to bear on the subject, it is necessarily tightly closed to the unitiated laity; and therefore is regarded by them with suspicion, if not as a pomptuarium which secretes in its innermost recesses, instruments and recipes specially devised to torture mankind. Granted that this contention is true, we must continue to despair of the enlightenment of the masses; and that our position in the matter is not untenable, the success of the mystagogues who flash meteorically across the horizon from generation to generation, readily shows. We have yet to see the time when a furor is not raised by the exhibition of a bone that has a saintly history, or the advocacy of methods which do away with surgical operations. But the etiolated author of "Science and Health" does not imitate the miracle-worker who, in a fine frenzy, exhorts his followers to believe implicitly, or be exorcised; she is, though, leading the sheltered life, too decidedly in touch with the drift of thought as it is expressed by the groundlings, not to know how best to propitiate them. Hence "Science and Health" with its wealth of superficial arguments that breathe the very spirit of self-complacent sciolism!

Haydon, on hearing of Keats's death, wrote: "For six weeks Keats was scarcely sober, and—to show what a man does to gratify his appetites when they get the better of him—once covered his tongue and throat as far as he could with cayenne pepper, in order to appreciate the delicious coldness of claret in all its glory," and we doubt if there is a medical man extant who can appreciate, to their fullest extent, the inanities of Mrs. Eddy's masterpiece, without a like artificial stimulation. For being inured, through his readings on medical subjects, to the best thought of the medical master-minds of the day, he surely must gasp at the two following quotations: "Health is not a condition of matter but of Mind; nor can the material senses bear reliable testimony on this subject * * * The divine Principle of Science, reversing the testimony of the physical senses, reveals man as harmoniously existent in Truth, which is the only basis of health; and thus Science * * * heals the sick," and "the daily ablutions of an infant are no more natural or necessary than would be the process of taking a fish out of water every day and covering it with dirt, in order to make it thrive more vigorously thereafter in its native element."

The latter excerpt, a plea for the continuance of dirt, reminds us of the happy thrust Charles Lamb dealt out to Martin Burney at a game of whist. "Martin," said the gentle humorist, "if dirt was trumps, what a hand you'd hold."

GENERAL CULTURE AND TECHNICAL KNOWLEDGE.

Quite recently the information has reached us that there seems now to be no special outward type for the medical practitioner, except possibly where he is found in sequestration in some remote rural district. This observation bears the hall-mark of verity as it emanates from no less a source that the Société de Sociologie of Paris. Whatever else this society may be doing, it is surely throwing much light on the professional types of France, and as the French have always been the leaders in art and fashion we may safely assume that what holds true there today will be the vogue among us tomorrow, that our manners and customs will stride on apace; but let us first discover whether or no we have not already arrived. A moment's consideration will show us that at least the younger members of our medical profession possess no outward distinguishing mark of their calling. We can see clearly that in the larger cities and towns, even in the country, the physician obeys the call of the social world about him; he is often a golf or tennis player, he may drive a motor car, in fact he takes part in the various avocations prevalent in his community on an equal footing with other men of his standing. Rare, indeed, is it to see today any remnant of the top-hat, long-tailed coat, and ready Latin or Greek platitude that so characterized the physician of a generation ago. Rarer still is it to find that attitude of aloofness, or that magic circle of mental superiority surrounding the physician which was formerly as natural for him to assume as it was for him to flap his coat skirts with his hands behind his back.

The causes which have led to this breaking down of the older barriers of class are too complex and too various to be considered. We can but admit the statement as true that the doctor of medicine is at present much the same in appearance and behavior as is the lawyer, the professor, or the doctor of philosophy. All these gentlemen, even the clergyman, have more or less conformed to the general type so far as outward appearance goes. One or the other of them may be respected or feared for his mental attributes or for his behavior, but outwardly they are much the same, and have given over the practice of those grimaces of superiority that they were want to assume when conversing with or appearing before their brother laymen.

Granting this to be true, let us consider the mentality of the physician as compared to the mentalities of his associates. de Tarde has compared the mind of the physician with that of the lawyer as follows: The physician, he says, believes in external and immutable truth while the lawyer admits only an internal and variable truth; that is, a psychologic truth. The lawyer being accustomed to controversial reasoning and to the relative truth of ideas, is ready to discuss and to argue, while the physician, looking up to absolute and external truth, yields to facts without discussing them. The physician gets this point of view from his scientific and technical training; a training which is characterized by its yielding submission to facts, and herein is a salient weak point, for before facts are blindly accepted they must be correlated, interpreted and from them correct deductions drawn.

The history of the development of medicine as a science is replete with examples of the error and hopeless degradation that follows the acceptation of rigid dogmatism and the building of creeds upon a theoretical conception based upon more or less correctly interpreted facts.

Though the physician has changed his outward appearance and has conformed to a general standard of behavior, we feel that his mind is still untrained in philosophic reasoning. We feel that as a class physicians are inclined to confound more or less hasty generalizations with facts and adhere to them blindly as to a religious belief. One has to but look about himself to see this process in operation, tinged at times with frankly admitted superstition and avowed ignorance.

The fault lies in medical instruction and we feel it is a fault that is growing greater rather than less. For, is not medical teaching becoming more strictly technical? Is there not a remarkable advancement towards specialization? We feel quite sure that the mentality of the physician suffers from a lack of general culture, from a narrowness of view, and from a blind adherence to what he regards as established fact.

Specialization demands a word. It is no longer possible for an individual to attain and hold encyclopedic knowledge. Nevertheless, we feel that the true aim of education, especially of medical education, is to give the power of understanding facts and ideas and arranging them logically according to their relative significance. What Liard wrote more than a decade ago seems especially to the point. "Specialization is becoming more and more of a necessity nowadays. It imposes the necessity for opening before the young mind—before the hour of inevitable specialization—the whole broad field of science if the individual is to be anything more than a mere machine. The young mind realizes better the dignity of the special work which it takes up later if it comprehends the relation it bears to the whole and to general knowledge."

Some one has said that there are three ways of looking at the world and that every individual adopts one of these ways predominantly. The first is the natural, the second the ethical and the third the poetic. One views the world as *thing*, one as *law* or *abstract intelligence*, and the third as *personality*. Of course, no one has one of these outlooks to the absolute exclusion of the other two, but it seems to us that the medical mind is inclined too much to view the world as a definite thing, losing all sense of relative values, and inclined to ignore entirely the point of view which attributes to facts a certain personality and flexibility.

The advance which has brought the medical man out of a distinct and remote sect similar to a priesthood, has worked wonders for his mind in the way of increasing his general culture. We feel that medical education must note this step in progress and must concede the necessity of producing a character of mind that will be able to assume in the future the dignified position which should be accorded to medical knowledge; and this means that steps must be taken to increase the general culture and to limit the tendency to strictly technical thinking on the part of the student of medicine.

THE MEDICAL TEMPER.

The spirit of the times, no longer content with the grosser problems of life, is displaying unwonted intellectual activity in connection with such abstruse subjects as the artistic and the scientific tempers. The literary weeklies have laid rather unloving hands on the weaknesses of the former while a number of medical journals, principally the British Medical, have been guilty of considerable emotional violence in discussing what, strange to say, must have been an unknown quantity to them before their criticisms appeared—the presence of certain flaws of a very human nature in the temper of the modern scientist.

The columns of our journal are happily exempt from any discussion of the irascibility and peevishness peculiar to artists, and as for the temper of the scientific sort, the medical journal above mentioned has expatiated on its vituperative and militant tendencies, until one would think that the pursuit of science was inimical to the proximate attainment of those models of calmness and serenity, which should have the greatest appeal for him who labors in behalf of mankind. These two tempers having received due attention on the part of discerning critics, it is meet that we should turn to the temper which concerns us most, namely, the medical.

Observations covering a goodly number of years, and the result of a view-point which we hope has always been inflexibly objective, with no ulterior thought of the personal equation, have brought us to the point

where by envisaging the subject in its entirety, illuminating deductions, as to the querulousness of the medical temper, have been reached. That the medical temper is frankly bourgeois is a truism that should call for no comment at this day. Its very essence proclaims it as such. But though the democracy of its complexion bears irrefragable testimony to its candor, its virility, its impeccability, the lack of a close association with intellectualism of a superior order, necessarily compels it, in circumstances which obtain only too frequently in the practice of medicine, to evince an over-sensitiveness, and to resent slight criticism or the fatuous attacks of weaklings, by a child-like garrulity.

While we are fully aware that as mundane affairs are arranged at present, doctors do not live in "the island-valley of Avilion; where falls not hail, or rain, or any snow, nor ever wind blows loudly," to fling down the gage just because a fellow-practitioner is critical or a small part of the public is inappreciative, indicates that the medical temper is too readily affected by the strenuous currents of modern life to approach that mental clarity which should make it a fortunate possession. It is a long story—the bickerings, the misunderstandings, the obvious conceits of the medical temper; and far be it from us to dwell here on the prodigious mass of jostling thoughts, on the part of the rank and file in medical circles, brought into play when well-known doctors gird at each other because a friendly criticism, which brushes the fulsome, has been the unsolicited meed of the earnest endeavors of a fellow-practitioner.

That the kind of temper here treated is the means of obstructing the channels through which medical thought flows in its onward march to the larger, mightier world-thought, should not be overlooked by those whose desire is the dignified elevation of the doctor and the proper dissemination of medical knowledge. The degree of the passions and vanities of human nature, at present dominant in the medical temper, should be lessened so that a milder note of tolerance, sympathy, and of duty towards the world, might be effected. And although it be true that, as George Eliot says, "prophecy is of all the mistakes we commit the most gratuitous," we cannot refrain from predicting that with less irritability, moodiness and crabbedness, the medical temper would stand for much in the thinking world; it would have a meaning, a value, a weight far greater than it enjoys today; and even the laity might be persuaded to judge it otherwise than through "the prism of whispered gossip." Then, and only then, will the imagination cease to boggle at the picture of its crudities and petty meannesses.

LITERARY NOTES.

That malaria has been instrumental in changing the face of history is expatiated upon by W. H. S. Jones, M. A., in his book, "Malaria: A Neglected Factor in the History of Greece and Rome" (Macmillan & Bowes, Cambridge, England). To subvert completely our college ideas of the history of Greece and Rome would indeed be too iconoclastic, but be it said in connection with this book that though on the face of it, the military heroes and their devastating armies lose some of their glory by comparison with the devastation effected by the ravages of malaria, a closer reading evinces the fact that this is not the author's purpose; his object being to show the hitherto unrecognized role malaria played, alongside the military heroes, in accomplishing the defeat of an enemy. The book is of especial interest to students of medical history.

Dr. Albert Deschamps is the author of an interesting work in three volumes, the first volume of which has recently been published at Paris. The title "Les Maladies de l'Energie" is in itself instructive enough to give the reader more than a mere inkling of the character of the book. In the first volume the author discusses general asthenia, exhaustion and mental and physical insufficiency. What adds a certain piquancy to the work is the fact that Dr. Deschamps himself was, during a long period of years, a sufferer from psycho-nervous disturbances, and the description of his ailment is a bit of autobiography very seldom found in medical literature. Since energy has so often been misdirected in this country, an appreciative reading of this work might be a lesson to those who foolishly waste, instead of conserve, their strength.

M. Amar, demonstrator of applied physics at the Paris Faculté de Médicine, has written a brochure on the highly interesting subject of inverted astigmatism as an anthropological factor. Inverted astigmatism, as is well-known, is exceedingly rare. Wecker and Javal, having observed a certain number of cases among the Jews, thought that this anomaly could perhaps be explained by the strange characters of Hebrew script, the letters of which are horizontal, instead of vertical, as in other writings. During a trip, covering some four months, through Italy, Sicily, Tunis and Algiers, M. Amar made by means of an ophthalmometer more than 1200 determinations of astigmatism, with results which showed that inverted astigmatism, though rare in the north of Italy, increases materially as one travels in a southerly direction. Starting at the African sea coast, the increase in inverted astigmatism was noticeable from east to west and attained the proportion of 50 per cent of every hundred subjects examined. This high percentage was found among the Arabs in Tunis and Algiers and not among the Jews. Moreover the

ancient works in Hebrew disclose the fact that the letters were vertical and not horizontal, so if there is any connection between Hebrew characters and astigmatism, one must conclude that inverted astigmatism is peculiar to the Jews of modern times.

The Oxford University Press (New York) has in active preparation a number of important works which should have a large circulation among American doctors. The most important from the point of research and thorough editorship is the System of Syphilis to be completed in five volumes. All the contributors of the articles rank high in medical literature and with our knowledge of the worth and value of the former literary undertakings of such men as Jonathan Hutchinson, Elie Metchnikoff, William Osler, D'Arcy Power, Pye Smith and Von Bloch, we can say without hesitancy that this work will bear the hallmark of an extraordinary performance.

In his book on the Russo-Japanese war, Dr. Matignon mentions many facts which illustrate the Japanese idea of propriety. Directly the Japanese installed themselves in a village the first need was the bath; to further this end, channels were dug through which running water was allowed to course. The precautionary measure of embankments was not overlooked, and sentinels were stationed to prevent pollution by the admixture of extraneous matter. On the outskirts of the village latrines were erected for the natives; and proclamations issued by the commanders compelled their use. These military proclamations were indispensable as many villages in Korea and Manchuria were very filthy. Human excrement was thrown into the streets, for the idea seemed prevalent that a street was its proper receptacle. So much for economy and laziness.

In the first campaign against China, in 1895, the Japanese attempted to remedy the filthy habits of the Koreans. In the streets of Seoul they erected small buildings to be used by the public, the signs in Chinese and Korean proclaiming their object. The delinquents who violated the stringent rules laid down by the Japanese, were beaten with the butt-end of a gun and were immediately put to work as scavengers of their own filth. This method of reform, though apparently brutal, was most efficacious; and when some two years after the author visited Seoul, there were still indications of the civilizing work of the intelligent Japanese.

ORIGINAL ARTICLES.

TECHNICAL METHODS OF PERFORMING CERTAIN CRANIAL OPERATIONS.*

By Harvey Cushing, M. D., of Baltimore.

I purpose on this occasion to limit my remarks largely to a description of such technical methods as have come to be more or less habitual with me in the routine performance of the simpler operations of craniotomy and craniectomy—in other words, of operations in which a portion of the skull is but temporarily displaced, usually for the primary object of intracranial exploration, and those in which it is intentionally and permanently removed, usually for purposes of cerebral decompression.

Many of the views to be expressed are purely personal ones and are given with the full realization that the details of preparation and procedure which prove satisfactory to one may be entirely unsuited to the operative requirements of another.

Steps of an Osteoplastic Resection.

General Preparation. It is, I believe, a fairly universal custom to have the patient's head shaved and treated antiseptically in the ward on the day before the operation—some even advocate a double preparation of this kind. This I consider an unnecessary precaution, if not positively unwise; for the patient is apt to pass an uncomfortable night and, even with the most expert shaving, the scalp is likely to be a little "sore" the morning of operation. In something over 350 craniotomies I have never seen an infection, even a superficial stitch abscess, and have ceased to regard the chance of sepsis as a possible complication of these operations.

It is our custom, without previous ward preparation, to have the hair clipped and shaved just before the operation—a duty encumbent upon the surgeon himself in the case of a child or a nervous patient. After a double shaving there may be a preliminary cleansing of the scalp with green soap and a soft brush. The final preparation is deferred until after administering the anæsthetic.

Position on the Table. It is a great advantage, though I believe not a common practice, to place the patient on the table in the position most favorable for the operation before inducing narcosis. This not only shortens the time as well as the depth of anæsthetization, but it also insures the patient's being in a comfortable posture and thus obviates in large measure the strain leading to backache and like discomforts, which an awkward position and the handling of a relaxed patient engenders. It is particularly important to observe this rule in case the cerebellum or occipital lobes are to be exposed.

*Extracts from an Address before the St. Louis Surgical Society, December 16th, 1907. To appear in *Surgery, Gynecology and Obstetrics* for March, 1908.

For the usual operations on the vault, small, flat, solid pillows or sand-bags suffice to turn and hold the head in the desired position; on the other hand, I regard a head extension with shoulder supports as essential for occipital work, chiefly to insure free respiration.

The Anaesthetic. Regardless of the drug to be employed it is essential that it be administered by an expert—preferably by one who makes this his specialty. Many of the conditions for which these operations are attempted are associated with cardiovascular and respiratory disturbances of cerebral origin, and the greatest care must be exercised lest there be a further burden due to the anæsthetic. In all serious or questionable cases the patient's pulse and blood-pressure, their usual rate and level having been previously taken under normal ward conditions, should be followed throughout the entire procedure and the observations recorded on a plotted chart. Only in this way can we gain any idea of physiological disturbances—whether given manipulations are leading to shock, whether there is a fall of blood-pressure from loss of blood, whether the slowed pulse is due to compression and so on.

Sir Victor Horsley, as is well known, is a strong champion of a chloroform-oxygen combination. He emphasizes that only a small amount of the drug is required, except during the early and closing periods of the operation, and that there is less liklihood of vomiting than with ether. The drug is taken smoothly without cyanosis and, furthermore, tends to lower the blood pressure; hence there is said to be less bleeding during the operation.

In this country, where chloroform is doubtless administered less well than ether, the latter is the anæsthetic of choice at most hands, the primary stage usually being induced with ethyl chloride. Kocher believes that there is an element of risk in the lowered blood-pressure under chloroform, and it is perhaps debatable whether this is not a more certain danger than the somewhat greater loss of blood under ether—a drug which tends to hold the blood-pressure high.

The question of the anæsthetic in a two-stage operation is an especially serious one, and under these circumstances the dangers from chloroform would possibly be less than those of a repeated etherization.

Preparation of the Operative Field. With the patient anæsthetized and in the proper position on the table the final cleansing is done; for this alcohol and 1 to 1000 bichloride solution are sufficient.

It is my practice at this stage, before the landmarks are obscured by the covering of operative sheets and towels, to outline the proposed incision on the scalp by a superficial scratch with the scalpel. Those who have by long practice familiarized themselves with the rules of cranio-cerebral topography learn to visualize the main fissures with no greater margin of error than when measurements are employed. Furthermore as a large opening is to be made, an attempt to accurately determine on the scalp the point overlying a given center is today less essential than formerly when attempts were made to approach it directly by a small overlying trephine opening.

With the proposed flap thus outlined and the head raised by a hand placed under the back of the neck, a broad square of wet bichloride gauze is thrown over the entire head; over this in turn is placed a *tourniquet.*

For the control of haemorrhage from the scalp numerous forms of tourniquet have been advocated. Many use a simple rubber tube or Esmark bandage, both of which are difficult to apply and to fasten without slips in the aseptic technique. I have finally come to a form of rubber ring in which is inserted a buckle (Fig. 1) so that the tube can be made into a circle of any size and can be easily removed at the end of the operation. Practice enables one, with a given quality of tubing, to

FIG. 1.—Author's form of adjustable cranial tourniquet, with tapes applied.

estimate the size of the ring necessary in a given case to shut off arterial supply from the scalp without causing undue pressure. The ring, furthermore, is provided with a median tape whose length—measured after the head is shaved—should equal the distance from glabella to inion, and the object of which is to prevent the ring from rolling over the orbits, as it is likely to do if there is a prominent forehead. Having been boiled the ring is applied by the operator and an assistant, being snapped over the head from occipital to frontal regions (Fig. 2).

In the majority of cases all bleeding from the scalp is thus controlled though in certain patients in whom there is marked intracranial stasis

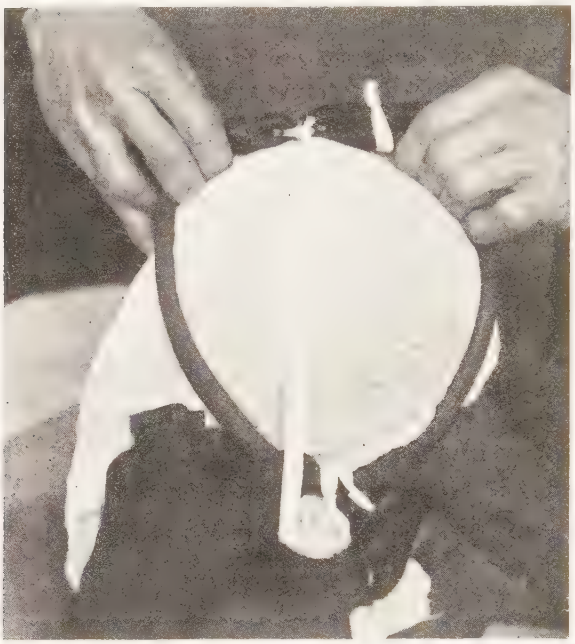

FIG. 2.—Showing tourniquet in act of application; held by assistant in sub-occipital region while the ring is slipped over the brow.

some of the veins on the concave side of the incision which receive blood through emissary vessels from within the skull may have to be clamped.

Around and just above the tourniquet a small towel folded lengthwise and wet in bichloride is tightly pinned, and to this is securely fastened

FIGS. 3-4.—Showing final preparation of operative field, with hood for anesthetist.

the large sheet which covers the etherizer like a tent and leaves exposed little more than the area outlined by the preliminary incision (Figs. 3 and 4). If there is any likelihood of the slipping of these surrounding sheets they may even be pinned directly into the scalp.

Such details of preparation are of especial importance, I believe, in operations whose approach lies toward the base of the skull; for example, in the suboccipital or temporal operations to be described. In those situations away from the vault the use of a tourniquet is, of course, impracticable, and as the operations may be prolonged, as in Gasserian ganglion work or in the exposure of lateral recess tumors, it is essential that the exposed skin-field, which may be only a few square inches in size, should be securely isolated from its questionably clean neighborhood.

The Osteoplastic Flap. With the operative field thus prepared the incision is carried down to the skull through gauze and soft parts, in the line previously scratched on the scalp. When the bone has been exposed it can be opened in a number of different ways.

It may be recalled that in the original operation described by Wagner the flap was outlined with mallet and chisel; Chipault, Keen, Küster and others have followed his lead. Most operators object to these methods on the score of possible concussion, even from the glancing blows which are given.

Toison, in 1891, suggested dividing the bone with a chain saw passed between primary trephine openings, so that *the cut should be made from within outward,* and this remains, I think, a first principle. Obalinski, in 1897, recommended for this purpose the flexible wire saw introduced by Gigli in the same year for obstetrical purposes.

Similarly the bone may be cut between the primary openings by sawing with a straight hand-saw from without inward. Special craniotomes, which cut in a circular fashion by swinging the blade about a fixed point, have been devised. The Stellwagen instrument has been highly praised by Philadelphia surgeons; a French tool of similar type was described by Codivilla in 1900. Though no preliminary trephine opening is needed these methods likewise possess the disadvantage of cutting from without inward, and as there is no guard the dura is likely to be injured by such *craniotomes à mouvement circulaire.*

Further, a linear cut from 2 to 3 mm. wide, of the full thickness of the bone, may be made with biting forceps of the Montenovesi or of the Dahlgren and De Vilbiss pattern. These instruments progress slowly, but they have the advantage of biting outward, so that there is little, if any, jar to the brain.

The electromotor has been employed to furnish the driving power for a number of instruments which possess a circular or spherical form and so can revolve, such as burrs, trephines and circular saws, of which there are many patterns, and it has led to the invention of a revolving tool with spiral cutting edges which is used by some operators. Cryer, in 1898, Sudeck, in 1900, and Sykes have all described instruments of this latter type, and while they are useful for certain purposes they

possess the disadvantage for osteoplastic work of cutting such a wide slot that when used for the entire incision the replaced flap subsequently rests on the dura instead of on the bone edges.

In the Doyen type of motor there is a long flexible arm between the motor and the revolving tool, which is thus driven from a distance as in the usual form of dental engine. Borchardt (1906) has made some desirable modifications of this apparatus and Bercut (1904) and Hartley (1907) have added the great improvement of having a cutting tool directly connected with the motor, which, weighing only 8 or 9 pounds and being capable of sterilization, is itself held in the operator's hands.

Surgeons who use electromotive force for osteoplastic operations are able to work very rapidly, and if this does not mean added risk of accident it is most desirable. I have clung nevertheless to the somewhat slower but certainly less dangerous operation by hand-driven instruments,

FIG. 5.—Crown of beveled trephine with loose central pin, having thumb piece to prevent its dropping out unless desired.

following a "combined method," which makes use of the following general principles: (1) Division of the bone between two or more primary openings; (2) incision by an advancing instrument from a single opening; (3) the making of all cuts from within outward; (4) the leaving of a beveled flap.

A primary opening through the thickest part of the exposed cranium, usually near the parietal eminence, is made with a hand-trephine (Fig. 5), which should be of generous size with a crown of fully 2 cm. I prefer a trephine of the Galt conical pattern with a beveled edge. Bleeding from diploetic vessels, if severe, may be controlled by the proper use of Horsley's wax.

One or more secondary openings (one is usually sufficient) at the upper edge of the incision are made with a Doyen perforator followed by a burr (Fig. 6). Then with a long-handled blunt dissector or dural

FIG. 6.—Doyen burr in use during operation.

separator introduced through the large trephine opening, the dura between these openings is freed from its bony attachments. On withdrawing the dissector the intradural pressure usually suffices to press dura against bone again and thus to check dural bleeding if any has occurred.

From the two trephine openings the lateral edges of the flap are then cut downward toward the base in line with the skin incision. The first half inch of these lateral cuts is made with Montenovesi forceps which leave a 3 mm. incision, followed by the weaker Dahlgren forceps (Fig. 7) as the thinner bone near the temporal region is approached.

FIG. 7.—Dahlgren forceps used for incision of lateral edges of bone flap when approaching thinner portion of skull in temporal region.

FIG. 8.—Showing Gigli wire saw in use for making beveled mesial edge of flap, with dural guard introduced through the two cranial openings.

A Gigli wire saw is then passed on a guide between the two openings, and the mesial edge of the flap is cut (Figs. 8 and 9) on a broad bevel

FIG. 9.—Showing Gigli saw stage of actual operation. Note dryness of field owing to properly applied tourniquet.

to enable its subsequent solid replacement without danger of its being driven inward by a snug pressure bandage. The flap is forced back by the insertion of blunt instruments around the edges and is broken across at its base.

As Hartley and Kenyon have emphasized, all flaps made on the cranial vault should radiate toward the temporal wing as a base, since this is the thinnest part of the calvarium, is most easily broken, and its covering of scalp is well nourished by the temporal vessels.

Bleeding from the expansions of the lateral sinus, in case they have been exposed by a high flap, is best controlled by the pressure of sterile absorbent cotton, pledgets of which I find to be as valuable for hæmostatic purposes in the intracranial part of the work, as is wax for the bone itself.

The Intracranial Procedure. At this stage, with dura exposed, if there has been a fall of arterial tension from loss of blood, the further

FIG. 10.—Osteoplastic flap and dura reflected. Note concentric rather than superimposed openings through scalp, cranium and dura; also broad bevel of upper edge of bore incision.

progress of the operation, especially in tumor cases, may well be postponed for a second session. If there is no contraindication on this score the membrane is opened in a line concentric with the bone incision (Fig. 10), leaving plenty of margin for subsequent suture. The membrane should be incised on a grooved director, especially if there is increased tension, for it is important to avoid any possible injury to the pia-arachnoid. In case the tension is so great as to threaten this, a lumbar puncture should be performed at this stage of the procedure.

The dural incision should not be made too near the median line, lest the edge of the parasinoidal expansions or the veins entering them be injured. If the mesial edge of the hemisphere is to be exposed it is best

to open the dura in this direction by a separate radial cut, and, if necessary, to rongeur away some of the bone toward the median line. This is preferable to an attempt at exposure of the mesial edge (foot area) through the primary osteoplastic flap—a procedure usually attended with great loss of blood.

If an incision of the cortex is necessary, whether for exploration, for extirpation of a given area in cases of focal epilepsy, or for the removal of brain tumors, the cortical vessels whose division will be necessary must first be ligated on each side of the proposed incision, which should, if possible, be confined to the exposed surface of a convolution and should not cross a sulcus. The finest strands of split silk, preferably black, should be used for these ligatures and they should be passed around the vessels with delicate curved French needles which are introduced and emerge in non-vascular areas. With these precautions the subcortical manipulations can usually be conducted with but little loss of blood even in most cases of tumor extirpation. Tumors which have approached and involve the cortex must be surrounded by a similarly placed double row of ligatures, between which the incision is made. Subsequent dissections are carried out with blunt instruments, and momentary pressure of cotton pledgets will usually check the oozing.

A brain which tends to protrude may sometimes be "dropped back" by elevation of the head and trunk or by evacuating cerebrospinal fluid. This can at times be accomplished by pricking the exposed arachnoid spaces and by milking out the fluid; at other times a lumbar puncture may be necessary, and the removal of fluid in this way during the course of an operation is of the greatest possible help under many circumstances and is free from the danger which attends a similar proceeding when the skull is closed and when there is intracranial pressure from tumor. In a number of cases in which tension was great and in which thorough exploration—as of the occipital pole, calcarine region or temporal base—was undertaken the needle has been allowed to remain in place during the entire operation. It is a new principle, I think, and has proven of great aid to me on several occasions.

Closure. Unless there is reason for permanent decompression, owing to an undisclosed, an inaccessible or an irremovable lesion, an accurate approximation of the dura in its two layers is desirable. It should painstakingly be made in order to prevent the formation of adhesions, or their reformation if they have been found and divided as the presumed source of irritative symptoms, particularly in certain cases of epilepsy. If a large cerebral defect remains after the removal of a growth, or if the brain has receded from its normal level, owing to evacuation of cerebro-spinal fluid, the space may be filled with warm salt solution before closing the dura and restoring the osteoplastic covering.

The bone flap is solidly replaced and the scalp is in turn accurately approximated in a broad surface. It is well to draw together the galea aponeurotica by a few buried sutures before closing the outer layer. For the latter many use a continuous suture, which has the advantage of speed. Inasmuch as the closure is completed before removal of the

tourniquet I feel the need of a most accurate and solid approximation, which is accomplished by placing about the incision a series of straight, round-pointed cambric needles which serve to keep the edges everted as each suture is tied. This assures a ridge of tissue with a flat apposition, which prevents subsequent bleeding from the vessels of the scalp (Fig. 11).

Drainage is occasionally necessitated—perhaps in 20 per cent. of the cases—by oozing from the surface of the dura; but it should be avoided if possible. When used, the drains are led out, not through the original incision, but through puncture wounds made in the scalp about 2 cm. to its outer side, insuring for the drain an oblique passage which can be occluded by pressure.

FIG. 11.—Showing method of closure of wound before removal of tourniquet. Note ridge of tissue made by ligatures, which when tied and locked to the side should prevent all subsequent bleeding from the scalp.

The wound is partly dressed and pressure exerted before slipping off the tourniquet; then an abundant dressing with an outer starched bandage is applied. The ears should be carefully protected with cotton to prevent discomfort from pressure.

The first dressing is made in forty-eight hours, when the drains, if used, and all the sutures are removed.

The method of temporary cranial resection was devised to obviate a subsequent defect in the scalp, and though I do not believe that even large cranial defects are necessarily harmful, they are certainly undesirable (particularly in unprotected situations and in the presence of increased intracranial tension) if a satisfactory exploration is possible without leaving them. The accessibility and removability of a cerebral tumor can rarely be determined before the hemisphere is exposed. If

the tumor can be removed it is always desirable to restore the cranial wall; if it cannot be removed it is necessary to leave an opening, but the situation of this defect must be carefully chosen.

I have tried in various ways to circumvent the difficulties which oftentimes arise and to decide upon the best course of procedure in individual cases. In some a primary decompressive operation has been made under the temporal muscle—preferably upon the same side as the expected lesion—and the more serious exploratory operation deferred for a subsequent sitting or sittings. Indeed, in lesions of obscure situation this is always desirable, but I refer more particularly to lesions which have produced more or less definite focal symptoms. In some cases I have carried out a combined osteoplastic and decompressive operation, the thin portion of the temporal bone being rongeured away through the osteoplastic window, not only on the flap side but also well down to the base of the skull opposite to it—in other words, most of the bone, as in the usual subtemporal decompressive operations, is removed from under the temporal muscle while the rest of the bone-flap underlying scalp alone is replaced.

In this way a marked protrusion may be prevented. Experience has taught us much in regard to two things: (1) *The principle of cerebral dislocation* permissible in the presence of a large cranial and dural opening and of great importance in explorations; and (2) *the danger of decompression directly over a vascular growth.* The latter I think is not fully appreciated, for many surgeons who have written on the subject advocate decompression, if possible, directly over a tumor—a proceeding which often leads to a large hernia if scalp alone covers the growth, and which may be the occasion of hæmorrhage into a vascular growth owing to its change of position from protrusion through a defect.

Operations With Removal of Bone.

I have thus far in the main considered only those forms of craniotomy in which a flap has been made and then replaced. There remains a large number of operations—craniectomies—in which it is either impossible or inadvisable to attempt an osteoplastic resection.

Subtemporal Operations. Many of these operations are characterized by the removal of more or less of the thin cranial wall underlying the temporal muscle, whether they are conducted for purposes of exploration, usually in traumatic cases; for purposes of decompression, in states of increased intracranial tension such as those associated with tumor; for the removal of growths or natural structures like the Gasserian ganglion lying in the mid-cerebral fossa or even for the still deeper exposure of the third ventricle or the pituitary body. Not only is it difficult in this situation to make a satisfactory osteoplastic flap, but the precaution is unnecessary if proper use is made of the temporal muscle, fascia and galea in the closure.

In all of these operations, with a perfect technique and abundant experience in the proper disposition of gauze, towels and sheets, a small portion only of the head need be shaved (Figs. 12-13).

The steps of a subtemporal craniectomy differ somewhat, particularly in the manner of approach through the temporal muscle, according to the nature of the case, whether (1) a ganglion operation, (2) a decompression for tumor, or (3) an exploration in cases of cranial trauma.

1. In the *Ganglion Operation.* Here the muscle fibres must be divided and scraped away from the bone well down to the base of the temporal fossa in order, after making the small cranial opening, to give direct

FIGS. 12-13.—Photographs taken three weeks after decompressive operation with curvilinear scalp incision for pressure symptoms due to the edema of nephritis. Note partial shaving of head, allowing patient to conceal shaved area by parting hair on opposite side.

access to the base of the mid-cranial fossa without undue elevation of the temporal lobe.*

The small curvilinear skin incision, entirely within the hair margin, should be placed so as to avoid division of the upper branch of the facial nerve which innervates the occipito-frontalis muscle (pars frontalis). The muscle itself should be divided in horseshoe-shaped fashion, as in the older operation, and scraped away from the bone so as to bare the lower part of the fossa. I still think it is essential, for more

*At the present writing I have performed sixty-eight of these operations and have ceased to regard them as particularly difficult—no more difficult, indeed, than many of the extracranial operations which are advocated and which give no certainty of permanent relief in cases of major neuralgia. Two of my early patients I lost through inexperience; in the last forty there have been no complications of any sort.

reasons than one, to remove the zygomatic arch, and this can be done by crowding forward the periosteum and fascia from the point at the temporal attachment of the zygoma where it is crossed by the incision, without risk of injuring the aforementioned twig of the N. facialis.

If the soft parts are painstakingly closed in layers—muscle, fascia, galea and skin—there will be no apparent depression in consequence of atrophy of the muscle. A drain is rarely needed. Without tests for sensation it should be impossible to tell subsequently, by inspection alone, upon which side the neurectomy has been performed.

2. *The Subtemporal Decompression for Symptoms of Increased Intracranial Tension.* Here I think it is wise to make a curvilinear skin incision which is more or less concentric with the temporal ridge or line of attachment of the temporal muscle (Fig. 12). A flap of scalp alone should be reflected, with careful preservation of the stout galea-aponeurotica, which in turn should be incised and reflected, laying bare the temporal fascia. This fascia is then incised in line with its fibres at about the middle of the muscle. While the edges of the split muscle are carefully held apart, its attachments, together with the pericranium, are separated by an elevator from the bone under the entire muscle belly.

The bone is then entered in any way desired—I prefer a Doyen perforator and burr, followed by Montenovesi forceps and then by Horsley rongeurs as the opening is enlarged. The chief difficulties lie in the fact that the muscle cannot be elevated far from the skull without tearing it—an undesirable accident in view of the subsequent closure. Hence it is necessary to have a special form of retractor as well as flat-bladed rongeurs which can be introduced far under the muscle and which will bite away the thin plates of bone without jar. Care must be taken to avoid cerebral contusion by rough manipulations with the rongeur forceps.

A generous area of bone having been removed, it remains to slit the dura in stellate fashion to the edge of the opening. In cases of great tension this is often a difficult thing to accomplish without injuring the pia-arachnoid—an accident which may lead to very undesirable consequences. One can usually estimate the degree of tension by palpation, but if this is not conclusive a very small entering incision is made. If the brain tends to forcibly protrude, especially if it is dry and there is no escape of fluid with resultant lowering of tension, a lumbar puncture should be performed in order to accomplish this end.

A dangerous, at times fatal, procedure, as I have often reiterated, when the cranium remains closed and cerebral tension is great, lumbar puncture and withdrawal of the cerebrospinal fluid from below loses its hazardous features after the cranium has been opened. In these cases it is often of the greatest aid, for the tension usually recedes sufficiently to allow the free opening of the dura without risk of injury to the leptomeninges and cortex. In more than half of my subtemporal decompression cases for tumor—now nearly sixty in number—this measure has been resorted to at this stage of the operation.

In this operation again the wound is painstakingly closed in four layers—muscle, fascia, galea and skin. There is more or less protrusion under the closed muscle in these cases, though never a large hernia such as one sees in cases of decompression protected by scalp alone. Even should there be a particularly tense cerebrum there is little risk of the wound reopening owing to pressure if there has been a secure closure with careful approximation of muscle and fascia.

In the long run, for all cases of inoperable or inaccessible cerebral tumors this, in my experience, has proved to be the most satisfactory method of decompression, as shown not only by the lessening of discomforts, but by the most delicate of tests, the condition of the eye-grounds. There is one group of cases, however, which is an exception and does not receive much benefit from temporal decompression alone—namely, those in which the condition is complicated by a hydrops ventriculorum, due most often to closure of the iter by pressure of subtentorial growths.

Not only for tumor, but for other conditions of tension, will a subtemporal decompression prove to be often a helpful, sometimes a life-saving measure. Among these conditions may be mentioned thrombosis or embolism; intracranial syphilis—for the cessation of headaches and vomiting enables a subsequent antiluetic régime to be much more efficaciously carried out after the decompression; and many forms of oedema, more particularly in acute serous meningitis and in the oedema of nephritis. Of the latter I have had one remarkable case (Figs. 12-13)—a young woman, in a profound uræmic state, not benefited by numerous lumbar punctures, who regained consciousness after the operation and left the hospital better than she had been for many months, practically free from headaches and vomiting and with an extraordinary improvement in, though not a complete subsidence of, her socalled "albuminuric retinitis."

3. *The Temporal Exploration in Traumatic Cases.* Particularly in bursting fractures of the skull with general pressure symptoms and no external indication of the character and situation of the cerebral lesion, no site for an exploration is so likely to disclose the seat of trouble as one in the temporal region, and no form of operation is so likely to meet the needs of the conditions found as the "split-muscle" operation with removal of bone.

As drainage is often indicated in these cases I prefer to make the skin incision parallel to the line of muscle fibres, there being less need here for a protecting flap of scalp, since the pressure of the traumatic oedema is an acute process which subsides in the course of a few days. Otherwise the operative approach to the lesion is similar to that in the tumor cases.

Suboccipital Operations. For the exposure of subtentorial lesions—tumors of cerebellum or of the lateral recess, a basilar meningitis to be drained, the freeing of adhesions about the fourth ventricle resultant to an old inflammation, etc.—the principles of tourniquet and bone-flap are inapplicable, just as in operations conducted through the temporal

FIG. 14.—Showing table with outrigger for shoulder supports and crutch for head, for use in suboccipital and high spinal operations.

region. In this situation also, owing to the possibility of subsequent firm closure under muscle, there is little reason for preservation of bone.

Though many surgeons place the patient on the side for these operations I much prefer a symmetrical face-down position, particularly since I regard a bilateral exposure as desirable in all cases. This posture interferes greatly with respiration unless the shoulders are held away from the table to allow of free costal movements, and consequently a table outrigger has been devised for these cases, possessing shoulder supports and a separate crutch having a horseshoe-shaped top in which

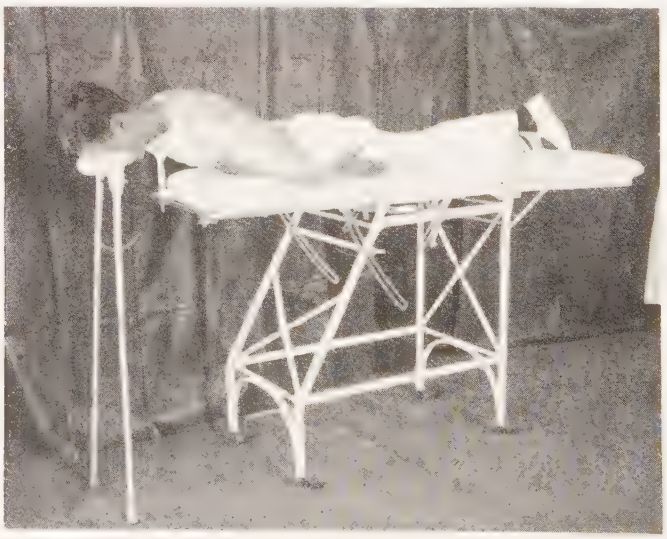

FIG. 15.—Same as Fig. 14, with subject in position.

the head comfortably rests (Figs. 14-15). The anæsthetic is sprayed against a mask attached under the "horseshoe."

In order to fully benefit from the "principle of dislocation" mentioned under osteoplastic operations, a bilateral exposure of both cerebellar lobes is desirable, to allow of the outward dislocation of the lobe on the opposite side during the manipulations of the other. This will permit of sufficient displacement to freely expose a cerebello-pontine tumor, for example, without the necessity of excising cerebellar tissue or, indeed, of injuring it in any way. For this symmetrical approach I find that it is desirable to make a median incision which divides the soft parts not only down to the occiput, but to the spinous processes of the upper cervical vertebræ, in addition to the usual curvilinear cut over the occipital ridge. This "cross-bow incision" gives an exceptional view, owing to the possible lateral reflection of the flaps.

Primary openings having been made in the bone thus laid bare they are enlarged with rongeurs, upward, so as to expose the lateral sinuses, across the median line, and then downward so as to include the posterior half of the foramen magnum. The dura is then widely opened and the mid-occipital sinus, if present, is ligated.

This opening, through the possibility of cerebellar dislocation, gives a wide area of exposure, either of the fourth ventricle or of the structures in the cerebello-pontine angle, and is desirable not only for exploration, but for decompression of irremovable tumors in this situation.

Although there is evidence at the present day of a certain rebirth or reawakening of interest in matters relating to neurological surgery, there can be no doubt but that, owing to the need not only of particular technical training, but also of wide neurological experience, the advances for the time being must continue to be made largely at the hands of those who choose to devote themselves to this and to exclude themselves from other fields of operative work. The day will doubtless come, as has been the case with all surgical specialties, when matters of operative therapy will be put upon a sound basis for certain conditions and will be shown to be futile in others; and when this time comes then may the general surgeon properly and safely undertake to carry out in routine these difficult and responsible measures and to include them among his numerous daily operations.

In the meantime there is much to be learned in regard to the cerebrospinal fluid circulation before the treatment of cerebrospinal infections or of acquired and chronic hydrocephalus can be dealt with; much to be learned in regard to intracranial pressure before we can finally determine the best method of decompression for inaccessible tumors, for the oedema of uremia, the swelling associated with cerebral softening, with encephalitis, with the so-called meningitis serosa, etc.; in regard to cerebral hæmorrhages before we can finally come to remove apoplectic clots as safely as we can those from the meningeal spaces; and in regard to many other of the diverse problems which come before the operating neurologist.

THE SCIENTIFIC RELATION BETWEEN THE HUMANS AND NON-HUMANS.

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At the International Medical Congress held in 1881, under the presidency of Sir James Paget, when the leaders of the medical profession of all civilized countries were assembled, the following resolution was passed:

"That this Congress records its conviction that experiments on living animals have proved of the utmost service to medicine in the past, and are indispensable to its future progress. That accordingly while strongly deprecating the infliction of unnecessary pain, it is of opinion, alike in the interests of man and of animals, that it is not desirable to restrict competent persons in the performance of such experiments."

This resolution seems distinctly to assert the inherent right of the non-human races to be exempted from the infliction of pain upon them by the human races, and that when this right is infringed, it must be demonstrated to be necessary on the ground of utility to both classes, that only so far as its utility can be demonstrated is the infliction of pain by the human on the non-human permissible.

In attempting to frame an academic scientific resolution at the Church Congress at Folkestone in 1892, Dr. Samuel Wilkes, consulting physician to Guy's Hospital, suggested that the position of the Congress should be expressed as follows:

"Seeing that the amount of suffering to animals is very great in supplying the wants of man, and therefore worthy of the consideration of the Congress, but hearing that the pain inflicted on them by experimentation for scientific inquiry is comparatively small, and also hearing from those who are alone competent to judge, that the knowledge thus obtained is eminently useful, we cannot as a body declare our disapproval of the so-called vivisection."

This resolution again acknowledges utility as a basis for the infliction of pain, but further brings in the position that the infliction of pain upon one ground of utility has some weight in determining the infliction of a lesser pain upon another ground of utility. We inflict a greater pain in butchery, therefore we may rightly inflict a lesser pain in vivisection.

Again Dr. Wilkes, in his paper on the same occasion, said that he considered that the scientific position of the human to the non-human is that the human "ought to be kind and not cruel to animals," but he further laid down his opinion that "right means might," and in support of his position maintains that:

"Animals are so constructed as to seize and devour those creatures which are more helpless than themselves * * * and so perpetual warfare goes on * * * As these are sensitive creatures, it does not want much imagination to picture to one's self the amount of suffering which must always be prevailing amongst these tortured creatures in every forest in

the world. * * * Man is an animal constructed like other animals with all their appetites and instincts * * * he pursues other creatures to kill and eat them, he also rejoices in the pursuit; so much so, that when not requiring them for food he still hunts and shoots them for pure enjoyment. * * * If man wants food he employs another man to fell an ox or cut the throat of a sheep * * * On account of the slaughtering of the seals for the sake of their skins * * * the pictures of hundreds of these warm-blooded animals being harpooned and writhing in their gore, mothers and young in heaps together was not pleasant to contemplate. But should a rich lady, not caring to dress like ordinary persons, wish for finer raiment, she deputes some one to go and acquire the warmest and finest skins and says 'strip it of its skin and I will handsomely repay you!' 'I have never,' says Dr. Wilkes, 'yet heard of a hint being given as to an animal having a right to its own skin, or even any compunctions of conscience on the part of the lady who has deprived him of it.' * * * Sometimes we eat our victims alive, previously putting a little pepper and vinegar on the writhing oyster before we swallow him. Then, for the sake of modesty, we usually pass over the gigantic amount of mutilation going on in the unsexing of animals so as to render them mere masses of fat beef and mutton for our own eating. * * * All these things we approve, or certainly do not condemn, and therefore I suppose they are strictly correct, but if so, it is nothing less than ridiculous to speak of the rights of animals."

The views, therefore, of scientific bodies of men and scientists upon the rights of the human to inflict pain upon the non-human race seems to be summed up in five arguments:

1. *The scientific view of life is not creation, but evolution,* and throughout the whole scale of evolution we find that the stronger preys upon the weaker and inflicts pain upon the weaker. Man, therefore, is only acting in harmony with the laws of his environment by preying upon all the non-human races and inflicting pain upon them at his own discretion. He is not bound to consider them in any way. The scientific conception of life is based upon the observation that every unit must progress at the expense of its fellow units, and the fittest alone will survive in the internecine unceasing struggle.

2. *Knowledge is the ultimate,* and, therefore, in his search for knowledge, the right of animals to life, liberty or freedom from pain vanishes. Man may, out of a supererogatory benevolence, take the trouble to minimize pain in the pursuit of his knowledge, but there is no scientific reason why he should do so.

3. The utilitarian theory of Bentham and the greatest happiness to the greatest number argument, when translated into the scientific field, may be stated in the terms that *when it is for the good of a life of higher evolution, a life of lower evolution should be sacrificed,* and that in calculating numbers in order to provide the greatest happiness for the greatest number you must take value into consideration also—a human life of high evolution is worth many sparrows of a lower development.

4. Since no sane person denies *the right of men to use the flesh of animals for food*, and their skin for his covering, and their strength and beauty for his comfort and pleasure and sport, and since this entails untold suffering upon the inarticulate races, it is illogical to deny man *the right to use animals for the purpose of experimentation*, or for any other object that scientific research may require.

5. *Animals may be specially bred for the purpose of performing experiment* or otherwise inflicting pain upon them at the will of men, and in such case the pleasure of living far outweighs the pain of torture, and man has, therefore, actually become their benefactor by breeding them for the purpose of torturing them. In shortly criticizing these five arguments I should like to point out the following general facts, which should not be overlooked:

(a) *To the scientist a man is really and truly an animal.* To the physiologist the difference between a human and an anthropoid ape is not one of essentials, but one of details, and the differences between an anthropoid and an invertebrate are far more characteristic and deep-seated than those which differentiate the human from the anthropoid. The presence or absence of chlorophyl may be a fairly constant standard by which one class of vegetable life may be separated from all animal life. The presence or absence of cellulose cell envelopes may be the great line of cleavage between the animal and the vegetable. The presence or absence of a notochord may be a permanent test to differentiate vertebrate from invertebrate, but where is the line which on physiologic grounds, separates humans from non-humans? The skeleton reveals none to the anatomist, the processes of assimilation and the methods of progression reveal none such to the biologist. The method of protective powers of the phagocytes to the invasion of disease and the ravages of alien micro-organisms reveal none such to the pathologist. The constituents of which bone and muscle and brain are composed are the same in humans and non-humans, and their analysis reveals no such difference to the chemist. The methods of reproduction and all that majestic mystery which surrounds the origin of new life, the union of cells, the germinal vesicle, and the great wonders of karyokinesis reveal no essential difference to the embryologist between the human and the non-human animal. Even the details are not of comparatively overwhelming importance, a rather larger brain and some deeper furrows in it sum up the chief details of difference between the tremendously vaunted human and the despised non-human. In the eyes of science man is an animal.

(b) *Pain is ever pain.* Whether I irritate a sensory nerve in a guinea pig or in a man the result is the same in kind. The scientific definition of pain knows no essential distinction between pain felt by a human and a non-human. With regard to degree, we have as yet no angiometer to measure pain, so that we cannot speak with exactitude; but observation of the way in which some men inured to rough life and exposure bear operations on sensitive parts and say that it doesn't hurt much; observation of the way in which races like the red Indians inflict

pain on themselves and on one another; observation of the agonized sensibility of some breeds of dogs to cold, neglect and harsh treatment, leads one to believe that when we do get an angiometer invented, it will show that some animals feel as much pain as some men, and that while some men hardly feel pain at all, some animals are acutely sensitive to it.

Any one who has kept a highly sensitive breed of dogs will bear me out when I say that my observation leads me to believe that such an animal has a more exquisite sense of pain than many a navvy.

(c) *That the unit is greatly modified by its environment.* That occupation and habit have a definite effect upon the course and progress of evolution, and that therefore the infliction of pain by the human on the non-human affects very definitely those brain centers which regulate automatic motion, and those still higher centers which originate thought.

That is to say, that if a human were placed in such conditions that his metabolic processes of life went on in the constant presence of the taking the life of and inflicting pain upon the animal world, the brain substance would be modified. Just as a mirror reflects what is thrown upon it, so would the brain give evidence of this environment when its higher nature began to originate ideas and motives. That is to say, that if a race be produced in the atmosphere of killing, and with the practice of slaughtering and inflicting pain going on around, it becomes a really scientific fact—as opposed to a mere ethical conception—that the substance of the brain will be so modified in character that its centers, when they begin to originate impulses, will originate impulses of killing and cruelty. From the most materialistic scientific conception of race evolution, therefore, it becomes a matter of importance to terminate an environment of butchery and the infliction of pain.

Science, therefore, must recognize the effect of habit and environment on race evolution.

Remembering these points, therefore, let us consider the five arguments previously adduced as to the scientific relation of the human to the non-human races

The first was the old fable reproduced from the fact in nature that the stronger ever preys upon the weaker, and that the fittest alone will survive. Man, therefore, being at the top, preys upon all beneath him.

Now I maintain that it is in the highest degree unscientific to contemplate one set of laws as if they were the whole. While we contemplate with a telescope the almost infinitely distant, we examine with a microscope the almost infinitesimally small. While we study the problem of centripetal forces in regard to dynamics, we none the less make allowance for the centrifugal forces also. So in the problems of evolution, it is easy to point to the palpable fact of individualistic antagonism and the survival of the one that fights hardest and holds out the longest, but this is only *one* side. There is the still greater evolutionary force contained in the principle of co-operation. Herbert Spencer has well put it that the state of *enmity* is ever tending to be eventually replaced by the

state of *amity* and this is but an expression of the truth that antagonism is a lesser dynamic force than co-operation.

The one-sided scientist may point to the thorn of the brier and the prickle of the thistle as instances of that antagonism which results in perpetuation of species, but he should also contemplate the tendril of the vine and the sweet flesh of the raspberry as instances where plants distinctly seek to perpetuate by invoking assistance, not antagonism. The vine leans upon the olive branch, and the raspberry gives the sweet fruit to the birds in order that the latter may carry away the seed and drop it in some new and fertile soil.

The one-sided scientist may point to the hosts of parasites that are ever destroying and living by the products of destruction, but he should also side by side contemplate the great principle of symbiotic existence, where the guest germ, while living upon his host's vital juices, pays him back in the work he does for him.

The terrible ravages of the bacillus tuberculosis may be pointed out as examples of the battle without mercy, but the existence of bacillus coli and the protective phagocytes of the blood must be contemplated side by side with them, as manifestations of the great league of amity which co-exists in nature.

It is true that in the very lowest forms of life you seem to get pure selfishness and antagonistic existence, the amœba is without father or mother, brother or sister, husband, wife or child, but one of the first steps of evolutionary progress is to manifest the interdependence of sexes for species perpetuation, and the next step higher is the material instinct of protection and the family tie of active co-operation. If I contemplate procreation in its purest scientific aspect, if I analyze motherhood into its simplest and baldest elements, if I dissect family life with the scalpel of critical contemplation, I find that the great scientific fact underlying them all is that evolution chiefly has its most stable basis in corporate co-operation and not in antagonistic warfare.

This then is my contention, that scientific man being the highest product of evolution must consciously recognize the deeper forces of progressive development, and manifest and cultivate them in place of the lower and more transient ones. The truest scientist is the one who comprehends most clearly the *whole* working of the laws of the universe.

The only scientific position, therefore, for humans to take with regard to fellow humans or non-humans, seems to be to terminate as rapidly as possible all forms of life, if any, which are distinctly inimical to the well-being of higher forms of life, and to apply the principle of co-operative assistance to every other form of life whatsoever, in order to consciously assist in this progressive evolution.

The second argument is that knowledge is the ultimate goal of scientists, and if this be so, and all intervening rights are to vanish, the rights of men alike, with the rights of animals, will disappear. Nay further, this argument would prove that experimentation on animals for the purpose of obtaining knowledge useful to the human race would be eminently unscientific, because knowledge gained by experimenting on

an animal refers in strictness only to animals of the particular class to which the one experimented on belongs. Upon the above ground scientific experimentation to obtain knowledge relating to the human animal should be carried out on human beings. If we accept as a scientific position that the attainment of knowledge is the ultimate of science, then I confess that animals have no rights whatever, but I must include the human animal among the rest, and therefore to put it in the terms of the title of my paper, *neither animals nor men have any rights whatever.*

The third argument appears to me to be unanswerable. If we adopt pleasure and pain as the ultimate standards of measurement, and aim at obtaining the greatest happiness to the greatest number, we must, in counting numbers, take value into consideration also, and confess that one life of high evolution is worth many lives of lower development. To ignore this is to ignore our scientific standards of comparative value. If, then, a man and a dog were in a boat together alone, and the problem were presented that one must die to enable the life of the other to be perpetuated, it would be in consonance with the scientific standard of life values that all else being equal, the life of the dog should be sacrificed to preserve that of the man. In the same way it seems to me to be equally sound to lay it down that if a human life is to be preserved for a definite time by shortening an animal's life by a similar period, or by inflicting an amount of pain which when weighed in extent and degree is less than the amount of pain which would result from the shortening of the continuance of the vital phenomena in the human, then it is scientifically sound that the life of the animal should be so shortened or the pain so inflicted.

I confess, however, that this abstract statement is of little value as a guide to material problems. We have no psychometer or angiometer, so that we cannot comparatively weigh lives or pains. We know that in certain diseases the pain becomes so intolerable that the patient begs to be put to death, but we have no method of gauging the point at which the pain of living exceeds the painful loss of dying. Again we may rightly claim that the life of a man is of more value than that of one sparrow, possibly of more value than a hundred sparrows, but is the life of a single Judas of more value than the combined lives of all the animals on the face of the earth? If not, then we have two definite points of value, viz.: *One human life is of more value than the life of one sparrow.* But *one human life is of less value than the combined lives of all the animals on the earth.*

But how shall we decide the method of obtaining even an approximate equivalent in such an immense area. We have no standards of life values, and, therefore, it is absolutely unscientific to talk about the necessity of sacrificing a thousand dogs or guinea pigs, if need be, to save one human life, because we do not know the comparative values about which we are pretending to dogmatize. Remember, too, that saving a human life simply means the lengthening of it for an indefinite period of a few minutes, hours, days or years, and is a very loose mode of speech. It may also mean the mere lengthening of it for a short time

in pain, or in idiocy, or in a state of semi-crippledom. Again, human lives vary much in value. I was careful to guard myself in stating my previous problem by saying "all other things being equal," but I am not sure that owing to many other things being unequal, it not infrequently happens that a so-called animal life is not less valuable than a human life, or that it may be even more valuable. As far as one's rough methods of estimation go I am often led to think that the life of some humans—wrecked, sin-blighted and sin-blighting—is really a minus value in the cosmos, and that the function of a more accurate science of the future may be called upon to set free those perverted forces that they may be sent back into the furnace to be reconstructed.

I have seen a semi-human dog and I have seen a semi-reptilic imbecile man, and with the rough standard of measure that I possessed, I should have estimated the life of that so-called dog to be of more value than the life of that so-called man.

Again, if this argument be scientifically carried out, sentiment must be excluded and not only must an animal life be sacrificed to save a human, but a lower human must be terminated to save a higher human. The old argument of the slave holder would be scientifically accurate. The economic theories of those races who eat their senile relatives would be scientifically sound, and the wastrels of our workhouses, our prisons, our asylums, and our hospitals would rightly be sacrificed for any purpose by which the better lives of the community would be saved.

Let me put this scientific position in the bald logical way it was once put to me by a Roman Catholic priest who was laying down this scientific law of comparative values, and the rightful sacrifice of the lesser on behalf of the greater. "It appears to me," he said, "to be scientifically sound that all who are condemned to death by law, or who are condemned by a competent tribunal as possessing lives which are either useless or harmful to the community, should be subjected to any experimentations which were found necessary for the welfare of the human race as a whole until they died; and that their dead bodies, if wholesome, should be made into soup, and distributed daily at the prison gates to their industrious and valuable, but poor, fellowmen!!!" To sum up this position, then, lives vary in value.

In case of antagonistic claims the lower developed life must be sacrificed to save the higher developed life.

We have, however, no standard by which to measure the value of lives.

Some non-humans may be of more value than some humans, and finally the law must be applied also as between humans of varying life values.

Judged by this standard there is no justification in slaughtering animals for human sustenance, first, because human lives can be sustained in equal vigor and perfection on a non-flesh dietary; and secondly, because we have no means of judging whether or not the lives of the countless animals which are slaughtered for the food of the one human, are not as a totality of more value than the one human life they are pre-

sumed to save. Judged by this standard, indiscriminate vivisection, e. g. the Pasteurian vivisections, which are said to acutely torture and destroy the lives of hundreds and thousands of dogs and rabbits, or the Mantegazzi experiments, which are records of fiendishly exquisite agonies inflicted on large numbers of animals, are eminently unscientific; because, firstly, it is the infliction of definite pain on and the definite destruction of, lives of lower animals for the problematical saving of the lives of higher animals; and secondly, because we have no scientific standard by which to measure the value of the numerous lives pained, shortened and destroyed, so as to weigh them in the balance with the human lives, if any, which have been spared the agony of hydrophobia and the loss of a shortened existence. Judged by this standard there is no justification for much so-called sport nor for such atrocities as are caused by seal fishing, or similar destruction of life, or infliction of pain.

The fourth position seems to be a begging of the question. It is said that the world agrees that flesh-eating is right and fitting though it entails much pain, and therefore vivisection, which entails comparatively little pain, is right also.

The world may say that flesh-eating is right though it entails enormous tragedies and agonies, but it does not follow that the dictum of the world, swayed by the love of selfish gratification, is right. It is, therefore, not scientific to take an unscientific dictum as the foundation for a scientific superstructure. It is true that an anti-vivisectionist who dares to judge and condemn a vivisectionist and yet eats flesh food himself is illogical, but the needless torture and destruction of animal life by the anti-vivisector is no scientific ground for acquitting the vivisector. Comparisons of this character are not scientific reasons, and therefore this argument may be dismissed.

Lastly, it is said that animals may be bred by men, and that therefore the man who gave them life, may use that life for any purpose whatever, for life being the greatest gift, no amount of pain he may inflict will outweigh the greater gift of life itself.

This is a startling proposition and a very subtle one, but it assumes where it should rather afford proof. What scientific evidence have we that man has the power to create life. He may say that here is the spermatozoon and there is the ovum, that if he interferes he may prevent the two ever coming into contiguity, and so may prevent the germinal vesicle and its subsequent embryonic development and perfect organism ever coming into existence; on the other hand, he may definitely take steps to bring the two into apposition, and so may claim that he is as much the creator of the new life as the inventor claims that he is the creator of a new product, because the latter has but organized and combined natural and pre-existing laws and forces to obtain the end which he has obtained.

A scientist may indeed say: "I have bred such and such an animal," but he cannot claim that he has given life to that which otherwise would not have had life, and I will tell you why. We have no evidence that the sum total of life can be increased. When we draw near to the fountain

head of vitality, we are no longer scientists but mere blindfolded children of the mist, feeling dimly in every direction, and so far only grasping shadows. When we have solved the mystery of vitality we may make a claim of this sort, or we may be conscious of the folly of claiming it.

At present, in our ignorance of what we are doing, it is unscientific to assert that we have given life (i. e. increased the sum total of vital force) to anything.

If amid the shadows there be any glimmer of light, it seems to lie in the direction of the constancy of the sum total of vitality, and that, therefore, though man may bring together all the mystic mechanism of reproduction there will result no developing organism unless there was "free vitality" to endow the apposed machinery. The Leyden jar may be mechanically complete, but it needs the electric force superadded to make the charge complete. The machinery may be perfect, but the steam must be added before the leviathan moves. It may, therefore be, that man by his breeding interference has merely attracted free vitality into one channel which would otherwise have been attracted into another, and that, therefore, instead of bringing a life into being and posing as the greatest benefactor by having given the gift of life, he may have done no more than thrown a lasso over a free life and brought it into his particular enclosure. Just as well might the hunter claim that he had given life to the wild horse he had captured, or the boy to the bird whose cage he had changed.

When all is involved in mystery, it is unscientific to make claims which cannot be substantiated by evidence, but if I read aright the fragmentary tracings on the great cosmic walls, the evidence is all against such a claim. It is, therefore, unscientific to claim the right to slaughter animals for food, or use them for experimental purposes involving acute suffering and death on the ground that the breeder had bred them and was therefore the donor of life to them, and had therefore a primary right to decide their fate. It was the old claim of the Roman slave owner that he had bred the children of his slaves, and therefore by an indefeasible claim had the right of life and death, torture or mutilation upon them. It is curious to see this old claim revived in a scientific garb, but to revert to the method of argument I have used so often, if it *be* true, it is equally applicable to men as to animals, to humans as to non-humans. I should have just as good a scientific right to inflict pain and death upon my children as upon my bred pups or lambs.

In each case the claim of being the absolute owner of a life I had created would be equally *well* or *ill* founded.

Many accusations have been levelled at science because it is said that the pursuit of science makes men hardened and callous.

But to say that science can harden or degrade man in his relation to animals is to malign the most sacred of all studies. The village lout may stick a cock-chafer on a pin, or tie a cracker to a panting, fear-stricken cat, or throw a pup into a pond and stone it till it sinks exhausted. A cruel woman may drive or spur the tired horse till it drops, or leave a

mouse to die of hunger in a trap, etc. The swell sportsman may wound and torture and kill his hundreds of beautiful pigeons, and leave a piteous leasing of wounded animals slowly dying in the hedges and in their holes—dying of acute inflammation, after he had passed on with his gun. The woman of fashion may order men to go out to the arctic regions and flay the half dead seal and leave it wallowing in blood and groans—a mangled mother with its little ones pitifully bleating round the frightful object hour after hour till they die of slow starvation. The butcher may perpetrate all the horrors of the slaughter house for gain. But to the true scientist all such atrocities are impossible. The cockchafer, or the merest bit of it, is a reverent mystery to be dealt with as a sacred temple of most sacred life. The higher science—as opposed to popular marvel hunting and self advertising—is always reverent in the presence of the mystery of life. The lowest animal must ever be treated with the respect which is its prerogative. Science elevates and does not degrade the position of the animal world, and the final point that I would make is that science *increases the rights of animals by deepening the rights of man.* The higher the position in which science can place man, the nearer to the source and fount from whence the laws of the universe proceed, the greater and deeper will be the reverence for animal life, because the clearer and fuller will be the conception of the higher forces of amity over enmity in evolution. The lower the man the more cruel is he to his beast of burden, the higher the man the more nearly he approaches to those heights of science and gnosis, which are the crowning stamp of the true scientist, the more reverence has he for his fellow traveler—a true brother in the eyes of science—on the same spiral pathway of vitality, towards a perfection of evolution.

These views may be undervalued on the ground that they are theoretical and can be brushed aside by the experience of hospital life which says that vivisection and butchery form the essential but sad constituents of every hospital that would cure the sick.

This is only the result of habit. Every new hospital copies most of the vices as well as the virtues of its predecessor, but that it is not necessary is proved by the fact that at the Lady Margaret Hospital, medical and surgical cases of the gravest character are treated most successfully on a strictly fruitarian dietary, and the products of active vivisection, as well the practice of vivisection itself, find no place in its pharmacopeia or routine.

DIAGNOSTIC POINTS BETWEEN HYSTERIA AND ORGANIC NERVOUS DISEASE.*

By M. W. Hoge, M. D., of St. Louis.

It is obviously of great practical importance both to physician and patient that we should be able to distinguish, in a case in which hysterical symptoms are present, whether or not all the symptoms are hysterical, or whether some of them are due to anatomical changes.

While in the majority of cases of either condition the symptoms are sufficiently well defined and characteristic to prevent serious difficulty in diagnosis, yet not infrequently do cases of undoubted organic disease present some symptoms which are of hysterical or at least of psychic origin, and occasionally purely hysterical symptoms will so closely simulate those of organic disease, that very careful study is necessary to decide to which condition they belong.

With this thought in mind I selected the above title when requested recently to occupy some vacant time on the program of this society.

On consideration, however, I soon perceived that for the paper to correspond with the title in the sense of thoroughly treating the whole subject of differential diagnosis, would occupy much more time, both in preparation and reading than was at my disposal.

So I concluded to limit myself to the report and analysis of one case at present under observation which seemed to require at least careful study before a positive diagnosis between hysteria and organic disease was decided on.

The patient is a male, white, of German descent, age 35 years, is unmarried, and has been a farm laborer most of his life, though spending a part of each year in the city. He was first seen on September 6, 1907. Nothing of importance was obtained regarding his family history. His sister says he was delicate as a child, and had spasms when teething. That he was healthy as a boy and young man, of average intelligence, industrious and orderly. He never drank much, but used tobacco to excess until recently. Denies venereal sores.

At the age of about 25 years he began to have attacks in which he became unconscious, fell and was convulsed. These continued at intervals for about two years, ceased under treatment, and have not recurred. In July, 1905, while at work in the harvest field, he noticed a sensation as though he had been struck in the face, and a feeling of general weakness, probably more pronounced on the left side. He stopped work for probably an hour, then resumed it, though still feeling weak. The next day he consulted a physician and ceased work, but was able to go about and has never been confined to bed. For several weeks he had a chill every second or third day. His sight became impaired, he thinks, soon after the attack just described. He continued weak, tired easily, his gait was unsteady, and he had a sensation of numbness

*Read before St. Louis Medical Society, October 26, 1907.

in his extremities, more pronounced on the left side. Says the right side of his face appeared swollen for several weeks after the onset of his illness.

His sister first saw him three weeks after the onset and says that his mental condition was altered, that he seemed "queer, foolish and childish." After about two months he improved and returned to the country, but after three weeks relapsed into his former condition. Since then he has grown better at times, then relapsed. His appetite and digestion are good, bowels regular. He sleeps well and quietly. The urine is slow in starting, but he is able to empty the bladder. Urine contained neither sugar nor albumin. Heart sounds normal, arteries soft.

He has no pain and says he feels well except for weakness and numbness in the extremities. For the past year he says that at intervals of a few days he has had a "drawing sensation in the right arm, from the elbow to the shoulder, followed by a chilly sensation all over." This lasts about 15 minutes, and he then feels as well as before. On inspection the patient appears fairly well nourished, though he says he has lost 15 pounds in weight, and does not seem anæmic. When in repose his expression is rather blank and staring. There is a tendency to stammering in speaking. His memory is fairly good, his account of his illness agreeing substantially with that of his sister. His comprehension is somewhat impaired. A statement at all complicated must be repeated, to be understood. He has no delusions, and has had no emotional excitement or depression. His conversation in general gives the impression of some degree of mental enfeeblement. His station and gait are ataxic. He is unable to stand with his eyes closed, walks with his feet wide apart and veers from side to side. There is also some ataxia of the upper limbs, more marked in the left. His pupils are equal and react to light and accommodation, though somewhat slowly. The eye movements are equal, ample and well co-ordinated.

His muscular strength appears distinctly less than normal for one of his physical development, and the left side is weaker than the right, including the face. When the limbs are extended, the left become tremulous and droop sooner than the right, and when the face muscles are kept forcibly contracted, a tremor develops on the left side, and it relaxes somewhat while the right side continues firmly contracted. The tongue is protruded in the median line.

There is a left hemianæsthesia, reaching not quite to the median line on the head and face, but extending somewhat beyond it over the abdomen, involving both limbs on this side, and somewhat more pronounced over the extremities. It is not absolute, and is more pronounced for pain and temperature than for touch, which is not much impaired. It involves the buccal mucous membrane and conjunctiva of this side. It has been constantly present to the same extent, but some variations in intensity have been observed. As stated, there is also subjective numbness in the extremities, most in the hands. The abdominal and cremasteric reflexes have been uniformly absent. The tendon jerks of

the triceps and supinator longus are distinctly stronger on the left than on the right, though probably exaggerated somewhat on the right also. The knee jerks are exaggerated. Usually a slight foot clonus may be obtained on the right, and uniformly a well sustained one on the left. The Babinski reflex can usually be obtained on the left, occasionally on the right. With such symptoms present, why, one may ask, should there be any doubt as to the fundamental disturbance being of an organic character?

Such doubt can hardly exist after it has once been established that they are present. To establish it has required some effort and discrimination.

The hemianæsthesia in this case is of the familiar hysterical type, and hysterical patients frequently complain of weakness or even paralysis, especially on the anæsthetic side. Their tendon jerks may appear to be increased, and occasionally the test for the foot clonus produces a tremor so closely resembling it as to deceive experienced examiners, so that I felt justified in considering the possibility of the whole disturbance being hysterical.

In eliminating the hysterical hypothesis, we first consider the mental state of the patient. He exhibits neither the undue concern about his ailment, the introspection and analysis of symptoms, the brooding over his condition, which we usually observe in hysterics, nor on the other hand the apathy and indifference which they occasionally exhibit. He is concerned about his illness, is anxious to get well and hopes that he may, readily takes notice of any apparent improvement and is on the lookout for it. The self-centered attitude of hysteria, interest in his malady as such, the craving for the interest and sympathy of others, have not been exhibited, nor the varying emotional states.

Such mental change as has been observed is in the direction of simple deterioration. While the anæsthesia is of the hysterical type it has so far not shown such alterations of intensity and distribution as to definitely characterize it as such, and since it might also result from an organic lesion, we cannot yet be positive as to its nature. The absence of the abdominal and cremasteric reflexes is so far favorable to the organic hypothesis, that it harmonizes with the other symptoms.

In hemiplegia, their absence on the paralyzed side and presence on the sound, is highly significant of the paralysis being organic. But in this case there is muscular weakness and an increase in the tendon jerks and slight foot clonus on the right side also, so that their absence on both sides is consistent. The point demanding most careful study is, whether the ataxia, increased tendon jerks and foot clonus are really present or only simulated.

As stated, the foot clonus may be closely simulated by a tremor. The intensity of the tendon jerks varies in different persons, and their production in a hysteric often causes a semivoluntary muscular contraction which increases and prolongs the reflex movement. These sources of confusion are the product of the mental state of the patient. She (or he) is uneasy and apprehensive of the examination, fears that pain will be caused, that too much or not enough will be found.

If the examiner gains the patient's confidence, quiets fears and succeeds in thoroughly distracting attention from what is being done, probably in all cases the spurious reaction will disappear. In the few cases of marked difference in the reflexes on the two sides and of tremor resembling foot clonus in hysteria that I have observed, this has occurred. Hysterical ataxia will disappear under the same procedure. Where distraction of attention cannot be otherwise obtained one would be justified in employing hypnosis, if it can be induced.

In the case that I report the opposite results are obtained. By making a strong voluntary effort, the patient can to some extent control his ataxia, but distraction rather increases it. In testing for the tendon jerks and foot-clonus, if he is watching the procedure and endeavoring to assist in placing the limb in a proper position, the reflexes are not so well developed. The tendon jerks are most pronounced, the clonus most distinct and well sustained, when complete muscular relaxation and entire diversion of attention are obtained.

The Babinski reflex, so far as I know, has never been observed in pure hysteria. Too strong or sudden irritation of the sole may produce a voluntary movement simulating it, but this may be distinguished by its suddenness, and by a general contraction of the foot muscles, producing a movement of withdrawal.

The reflex is a deliberate upward and backward movement of the great toe, produced by stroking or pricking the sole with sufficient force to produce moderate irritation but not decided pain.

While it was not obtained as promptly and distinctly as it is in many cases of degeneration of the pyramidal tracts, it could be produced at almost every examination on the left side, and occasionally on the right. From the above symptoms I feel justified in concluding that we have in this case a left-sided hemi-paresis (not being intense enough to be styled a hemiplegia) with slight paresis of the right lower limb and an ataxia, all due to organic lesions of the central nervous system, and a hemi-anæsthesia which is probably due to the same cause, though we cannot positively exclude its being of psychic origin.

I have in this analysis purposely refrained from employing the ophthalmologist's report, in order to illustrate to how definite a conclusion we may arrive in such a case without its assistance, not meaning to imply, however, that it should ever be neglected. Two examinations have been made by Drs. Calhoun and J. F. Shoemaker.

They report no ocular palsies except a slight paresis of accommodation. A distinct contraction of the visual fields, the relation of the color fields remaining normal. An atrophy of the optic nerves, uniform over the disc, and rather more advanced in the left than in the right, and which has increased in the past month. The retinal arteries are about one-third the size of the veins, which indicates that there has been a low grade of optic neuritis. Vision with correction at the first examination, 2-3.

Organic brain disease is one of the most frequent causes of optic atrophy, and its presence is in harmony with the conclusion already reached.

THE HISTORY OF THE HOUSE; THE STRUGGLE FOR FRESH AIR AND LIGHT.*

By George M. Gould, M. D., of Philadelphia.

Physicians and sanitarians agree that tuberculosis and pneumonia, if not other diseases, are house-diseases. In some way these afflictions depend upon improper living of men and women in badly constructed or ill-managed houses. In fighting the causes of these diseases we are in one way or another brought back to the question of houses, ventilation, etc. But as in all other etiologies and pathologies, we can not deal intelligently with the evil, nor accurately meet the problem in our treatment, unless we know the natural history of the cause, so in this we must know the history of the house in order to understand the finished result. To teach people the use of ventilation, cleanliness, and light, we must understand the reasons why, at present, they really prefer foul air, filth and darkness. For it is true that the vast majority of people of the world do prefer dirt, disease and darkness, and the sources of that preference must be seen in order to combat the evils. Go where one will in all occidental peoples there is either an utter indifference to the need or use of pure air, clean rooms and light, or there is a genuine dislike or fear of these things. Most animals are, in a state of nature, cleanly. The hog and other wallowing animals seem to us to love filth,—which means that by wallowing they avoid the diseases conveyed by flies,, mosquitoes, etc. The savage who covers his body with paint, mud, or worse materials, accomplishes the same result in a similar way. If you go into the majority of rooms and houses of the farming, working and poorer classes of our country, you will find the windows closed, the air foul, the food in summer covered with flies, the beds infested, etc. Only history can tell us why. Habits are national, racial, even cosmical, and the longer they are in forming and fixing the harder and more protracted will be their uprooting. The habit of bad houses and of house-diseases is the oldest of human habits.

The Homeric House, like the house of all primitive peoples, was a single room. It was four-cornered, and had openings in the upper part of the walls to let in light. These, also, of course, let in air, which was not always so undersired as in more northern climes. There is thus a most real and physical reason for the great truth of the proverb, *Ex Oriente Lux*. The Eastern houses had more light in them, because built for human beings, not cattle, and because light could be had without so much cold, as in the north. The house of the chief, lord, or king, was on the top of a hill, partly for pro-

*Notes, with some of the slides reproduced, of a stereopticon talk delivered before a number of medical, public health and other societies.

FIG. 1.—The open central court of the Mediterranean house, with windowless outer walls.

tection from enemies, and about it, and stretching away below were the huts of his common people, serfs, servants and soldiers. Thus grew the πολις or city, whence we get our own words, police, politics, political, etc. The earthly lord, in later times, became, in a way, the heavenly lord, and the hill-top kingly houses became temples. But however modified the original one-roomed windowless house was always to be discerned. The Acropolis at Athens, Rome, on her seven hills; the cities of Hissarlik, Tiryns, Argos, etc., are illustrations of the hill-top origins of the Mediterranean and more Oriental cities. The Roman capital, as seen from Mt. Palatine, and the Acropolis at the time of Hadrian, illustrate the history and early importance of the hill as a settlement place.

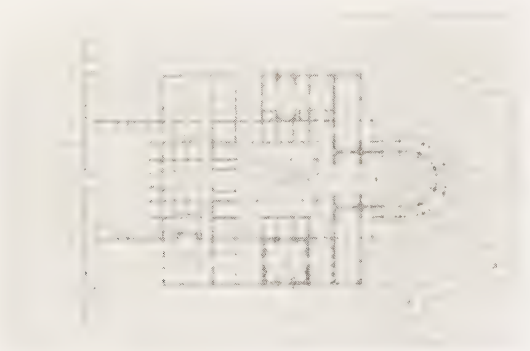

FIG. 2.—Ground-plan of a rich Roman house.

Italy was settled by invasion, and this emphasized the need of protection from enemies. The huts of the invaders were round, built close together, and surrounded by wooden palisades. They were usually on piles; they were of bushes or clay, and 10 or 12 feet in diameter. The need of more room was first met by making the round hut into an oval one, or better by bulging out the top. The materials being mostly inflammable, fire was also a great enemy, and the rain made ugly gullies between the huts and undermined them. Increase of wealth helped to change the round or oval hut into a square one, and widened the spaces between them; but, as pressure increased, the two walls of adjoining houses were made into one partition wall, and thus the street, with continuously adjoined houses, came into being.

Especially in Italy there was a medical fact that dictated the location of towns upon hills. The lowlanders were sickly, had ague, or as it was called, malaria, while the highlanders were more free from the pest.* It was not a very conscious plan, but the healthy, on Darwinian principles, soon "inherited the earth," or got it somehow.

The better and larger Mediterranean house always preserved certain peculiar characteristics, especially the windowless outer walls, and the open central court. Air and light were obtained from this court. How it worked out in the houses of the wealthy may be seen in the ground-plan of a Roman rich man's house, *e. g.*, that of Petronius (of *Quo Vadis*) and in pictures of similar Grecian interiors The warm, sunny climate permitted this type of house, and encouraged it.

North of the Alps the climate was cold, cloudy, foggy, etc., and the open court in the center was impossible, and if lit at all, the northern house had to get its light through the outer walls. In attempting to shut out the cold air, however, as glass had not been invented or come into common use, the air itself was shut out, and also the light. And from this comes the tragedy of our civilization. Upon this central fact we must keep our attention fixed if we would understand the history of the house, and one of the chief miseries of our life.

If transplanted north of the Alps, the Mediterranean type of house soon died out, because not adapted to our needs. In fact, we Teutons had to begin all over again, and went about it as did the earliest savages and preclassic hut-builders. How did they go about it?

Ingenuity was wanting in the Cliff-Dwellers of Arizona, and great labor was necessary to replace it. Enemies, here as well as in Greece and Italy, compelled them to seek the hill-tops, or the cliffs, or caves. Also for protection from enemies, the lake-dwellers had to build their huts on piles over the water.

*A suggestive book has lately been published: "Malaria, a Neglected Factor in the History of Greece and Rome," by Ross, Jones and Ellitt. "The Conquerer of Greece was not so much the Macedonian or the Roman as that great tyrant which now holds half the world—malaria."

FIG. 3.—The most simple and primitive of all houses, the Negrito house of Luzon, Philippines, yet the trees, rafters, etc., are visible.

But here should be noted the fact that governs almost all primitive hut-building, and the entire subsequent history of the house: Animals and men are parasites upon the plant world. The plant can make its tissues out of the sun, air, and inorganic earths in which it is rooted. The animals and man can not do so, but must construct and nourish their organs from the materials wrested from the vegetable world. So in the other great building work of mankind, the house is only to be made by materials furnished by plant-life. Not even the most artificial of civilized houses can altogether forego the

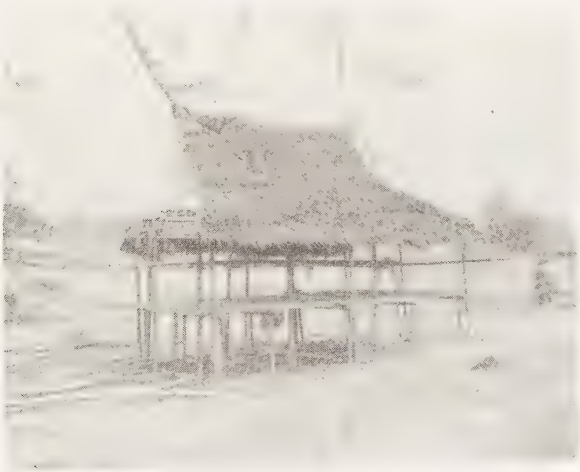

FIG. 4.—Moro house (Philippines) under construction at the St. Louis Exposition. Note the forks and rafters.

Fig. 5.—The Moro tree-house does not differ from that built upon the ground.

sapling and tree; its fashions, at least, are derived thence, and the early huts and the houses generally, of the past and present, are stamped with the seal of the tree. Keeping that in mind, we have an explantation and a revelatory insight into the history of architecture, and of civilization itself, which is a product of architecture. The Negrito houses of Luzon, Philippines, are the simplest in the world, but the trees, rafters, etc., are plainly seen. A Moro house, as illustrated in St. Louis, shows the forks of the rafters, seen also in the Moro tree-house.

The lake-dweller's house was made entirely of pales, saplings, trees, and was covered with brush,—thatch, or grain-stalks. In the

Fig. 6.—In the rigorous climate of the Esquimaux the poles are covered with the skins of animals.

FIG. 7.—In hot climates the house may become nothing more than the roof.

most rigorous climate of the Esquimaux the always visible poles are as necessary, but the cold compelled them to use the skins of animals to make it warmer. When the climate is very hot, and enemies are not about, the hut may be only a roof, as with the Indian on the Amazon, or among the Queensland aborigines. When the enemies are avoided by the hill-top protection, and when domestic animals are kept, the Philippine method is excellent. The importance of poles, as well as of thatch, and better constructive skill is shown by the Bakiris of South America. In China today millions of people are living in ingenious houses, but all upon the same plan. Where the summer is hot and the winter cold, as among the Kamchadales, one family may have one or more houses elevated on piles, and another below to protect from the cold. To keep their grain, etc., the Ainhus of northern Japan make elevated store-houses. Protection by palisade walls is shown in this village of the Bechuanas in Africa, and there is the beginning of a street. The beginning of a second-story house, the need of great protection from enemies, and considerable building skill, are all exhibited by the Arfaks of New Guinea, and all three

FIG. 8.—If enemies are avoided by hill-top protection and domestic animals are kept, this (Philippine) method of house-building is adopted.

FIG. 9.—With superior constructive skill the Bakiris of South America make better huts, also out of poles and thatch.

also among the Tagals of the Philippines. This well-made house of a Hova chief in Malagassy is noteworthy; there are three or four stories, an excellent roof, many rooms, roof and gable windows, etc. But do not fail to notice the V-shaped extensions of the rafters at the extremities of the ridge-pole.

Three occupations have come down to us from the earliest barbarisms, and are today persisting among us the same as throughout all human history. They are that of the savage, that of the charcoal-burner, and that of the soldier. And their house building epitomizes and illustrates the history of each. The savage, note well, preserves

FIG. 10.—The ordinary Chinese peasant house is constructed on the same principles with similar materials.

FIG. 11.—The African Bechuanas protect their similarly constructed houses by palisade walls.

the most primitive and make-shift style, appositely illustrated by the house of our own North American Indians. Columbus had no kodak, but we know the Red Man's tent of that time was a sorry affair. That of a modern chief is much "smarter," as he could get his canvas from civilization's looms. Poles, and always poles, are to be noted! In the progress of time the poles became more scarce, or the charcoal-burner* wanted a better-protecting house; but he had no mind to change his architectural style, and he built his cone-like teepee tent of stone. The chimneyless neighbors needed charcoal to burn

FIG. 12.—The Arfaks of New Guinea make their houses as all others have done, but secure protection from enemies by mounting them on poles high in the air.

*For a more detailed setting forth of the "Evolution of the English House," see the excellent book with this title by Sidney O. Addy, Swan Sonnenschein & Co., Lim., whence I have taken some of the following illustrations.

FIG. 13.—Note the forks of this well-constructed four-story house of a Hova Chief of Malagassy.

in their houses, to make horseshoes with, and to make transportation more easy; but they did not change their house-shape for thousands of years. So powerful is tradition and fashion, that there are perpendicularly-walled houses still standing whose doors and window-jambs still lean backwards. The house of the soldier illustrates and epitomizes the entire history of the race; at first, as in the invaders of Italy, it was a mere roof, or a round and thatched cone, or poled teepee tent, like that of the Indian, and this has come down to us as the form still existing. But as the round European village houses were perforce compressed into squared ones, so the most modern military tent, which all have seen, has become square. But it is single-roomed, of course, and one-storied. Some of the best are

FIG. 14.—The red man's teepee tent; the canvas is supplied by civilization's looms.

FIG. 15.—The oldest house, that of the charcoal burner (England); it is a teepee tent in stone.

beginning to show the beginnings of perpendicular side walls. A photograph of a part of the camp during the recent Manassas maneuv-

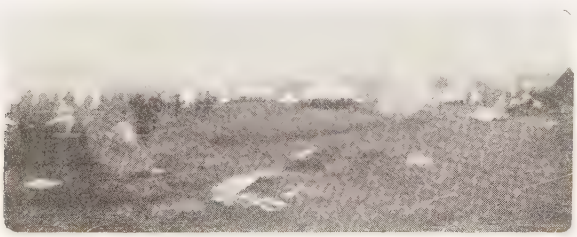

FIG. 16.—The modern military tents preserve the traits of all the oldest types of houses.

ers shows all three styles of house or tent in contiguity. That with rafters alone at the left, that of the round or teepee fashion, and the squared style with upright side walls.

(To be Continued)

MEDICAL AND SURGICAL PROGRESS.

OBSTETRICS AND GYNECOLOGY.

IN CHARGE OF
HUGO EHRENFEST, M. D.

BIER'S HYPEREMIA IN GYNECOLOGIC PRACTICE.

1. BIER'SCHE STAUUNG IN DER GYNAEKOLOGISCHEN PRAXIS.—J. Rudolph (*Zentralbl. f. Gynack.*, No. 39, 1905).
2. BIER'SCHE STAUUNG IN DER GYNAEKOLOGIE.—J. Eversmann (*Ibid.*, No. 48, 1905).
3. DAS BIER'SCHE VERFAHREN IN INTRAUTERINER ANWENDUNG.—F. Turan (*Ibid.*, No. 28, 1906).
4. DIE BEHANDLUNGSWEISE NACH BIER IN DER GYNAEKOLOGIE.—L. Nenadovics (*Gynack. Rundschau*, No. 9, 1907).
5. DIE SAUGBEHANDLUNG IN DER GYNAEKOLOGIE.—C. Weinbrenner (*Muenchn. med. Wochenschr.*, No. 40, 1907).
6. ZUR BEHANDLUNG DER DYSMENORRHOE.—O. Polano (*Ibid.*, No. 35, 1907).
7. ZUR BEHANDLUNG DER DYSMENORRHOE VON DEN BRUSTDRUESEN AUS.—H. W. Freund (*Ibid.*, No. 43, 1907).
8. ERWIDERUNG AUF DEN ARTIKEL FREUND'S.—O. Polano (*Ibid.*, No. 47, 1907).

"Stasis" (Stauung) can be produced for therapeutic purposes in three ways: by a constricting bandage, by thermic influences, and by suction.

A constricting bandage could be applied only around a long cervix. This limitation probably is the reason why this form of hyperemia has not been used in gynecologic work.

Heat in the form of hot air, the hot-water bottle, cataplasm, sitz-bath and douche has been for many years very generally used in the therapy of gynecologic diseases, and quite recently Hoermann (*Zeitschrift f. Geb. u. Gyn.*, Bd. 61., H. 1) has shown convincingly the many advantages of this form of conservative treatment over operative interference, in inflammatory processes of the uterine appendages.

The last mentioned form of "Stauung" suction was introduced into gynecologic work by Rudolph (1). He closed the ordinary tubular glass, or hard rubber, speculum with a cork stopper through which a glass tube is passed. To the latter a rubber tube is attached connected with the suction syringe. In his opinion inflammatory processes of the cervix and body of the uterus are especially suitable for this treatment; but he also mentions that possibly good results could be obtained in cases of amenorrhea, or in cases of rigid cervix before instrumental dilation is attempted. Shortly afterwards Eversmann (2) reported similar experiments made in the gynecologic clinic of the University of Bonn. The importance of constantly controling the effect of suction by watching the color of the cervix and the amount of the discharge, led him to construct a special apparatus. It is a tubular speculum made of glass, closed at one end, thus resembling in shape a large test tube. Laterally, a small glass tube is attached through which the air is pumped out. He considers cases of endometritis with a profuse discharge

as especially suitable. Firm, sensitive adhesions in the posterior cul-de-sac, according to his observations, soften and gradually disappear. Turan (3) anticipated a still more pronounced effect by a direct application of the suction to the endometrium. For this purpose he constructed a thick, metal uterine catheter with oblong openings at its distal end. He emphasizes that his method, in contradistinction to that of Rudolph and Eversmann, does not cause severe, labor-like pains. The reason for this seems obvious. Turan believes that his apparatus produces a negative pressure in the uterine cavity, and even measures it. He undoubtedly is mistaken. The uterus is not a rigid bag. If the air is pumped out, the soft endometrium must be sucked into the slit-like openings of the catheter. The negative pressure indicated on the manometer certainly does not exist in the uterine cavity, but only in the apparatus itself. Among the results obtained by his method the author mentions cessation of dysmenorrhoic pain, improvement of appetite, disappearance of the vaginal discharge and rapid healing of cervical erosions.

According to the teachings of Bier, passive hyperemia is preferable to active hyperemia in the treatment of all acute inflammatory, i. e., bacterial, processes. But for these processes in gynecologic practice, Nenadovics (4) reasons, suction is contraindicated. Suction applied to the cervix cannot exert any effect upon the distant appendages, and may prove dangerous on account of its pulling effect on the uterus. Thus it would seem that, in accord with the ideas of Bier, active hyperemia is the method especially adapted to gynecologic practice, and experience certainly bears out the correctness of the deduction. We need only remember the general use of heat, already mentioned. Nenadovics thinks that the best results will be obtained if an active hyperemia could be produced locally, limited to the area of inflammation. For this purpose he constructed still another apparatus. It is a glass speculum similar to the one devised by Eversmann, except that it carries two small glass tubes at its distal end, one being half as wide as the other. The narrower tube continues into the speculum up to its cervical end. Through it a hot fluid is permitted to enter the speculum. The fluid escapes through the wider tube and in this way a negative pressure is produced in the speculum. The result is a combination of an active hyperemia, produced by the hot fluid, and a passive hyperemia, caused by suction. But this author also believes that he can produce active hyperemia by means of suction if he applies suction rhythmically. He connects a syringe with his speculum, draws out the plunger but immediately releases it again, and continues this procedure. The author is convinced that his new method widens the indications for Bier's treatment in gynecologic work to a considerable extent, because the active hyperemia of his combined heat-suction method seems so well applicable also to inflammations of the uterine appendages.

There are a few other favorable reports extant (Weinbrenner (5), Bauer, Kroemer, Trancu-Rainer, etc.), but they are all based upon observations made on comparatively very small numbers of cases.

Thus it can be seen that the application of Bier's principles in gynecologic therapeusis is still in the experimental stage. Nevertheless, results so far obtained would seem to justify some hope that our limited variety of conservative methods in the treatment of inflammatory processes of the female genitalia, especially of tubes and ovaries, some day may be enriched by a new procedure, possibly as effective as the tampon.

A rather unique suggestion has of late been made by Polano (6) He advises the application of large suction cups to the breasts just before menstruation is expected in all those cases of dysmenorrhea in which internal medication, or local surgical interference, has failed to give results. In his opinion both theoretical considerations and clinical observations tend to prove a certain antagonism in the function of breasts and ovaries. He thought that an overstimulation of the breasts would reduce ovarian function, and thus probably lessen dysmenorrhoic symptoms. By means of a few histories of cases observed by him, the writer illustrates the fact that not only was the dysmenorrhea influenced favorably, but also that the appearance of the flow was retarded. In a very interesting manner Freund (7) attempted to prove that this assumed "antagonism" of function between breasts and ovaries does not exist. He thought that if suggestion, as an explanation of Polano's results, could be eliminated, there was still another explanation left—the effect of all irritation of the breasts upon the uterus itself. This fact was known to Hippocrates, who advocated the application of large cupping glasses to the nipples in all cases of profuse menstrual hemorrhage. In a new article (8) Polano defends his position and quotes the various facts which induced him to believe in the existence of such an antagonism.

ORTHOPEDIC SURGERY.

IN CHARGE OF
NATHANIEL ALLISON, M. D.

ISCHEMIC MUSCULAR ATROPHY, CONTRACTURES AND PARALYSIS.

The condition known as Volkmann's Paralysis or as Ischemic Paralysis was first described by Volkmann in 1875. Since the appearance of Volkmann's case, the Paralysis which bears his name has been described and investigated by many observers. In 1884, Leser added considerably to the knowledge of this condition and attempted to produce it experimentally on the limbs of animals. Though his experiments were not successful in producing this type of paralysis, he set forth a description of the pathological changes which it entails that has been the basis of most of the subsequent writings on this subject, and his name has been associated with that of Volkmann, so that in Germany the affection is designated the Volkmann-Leser Paralysis and Contracture.

During the last year Charles A. Powers (Jour. A. M. A., March 2nd, 1907) has contributed a valuable article containing an analysis of the fifty-two cases reported in the literature. This analysis which includes the original case of Volkmann may be summarized as follows:

Age. While in a few cases the exact age is not stated, there is reason to think that in at least forty of the fifty-two instances the patients were between three and twelve years of age. Over one-half of these were from five to ten years of age. Of the remaining adult cases no patient was over thirty-five.

Sex. When sex is mentioned, we find males, thirty-four, females eleven. In the English series the sexes are about equally represented. Nearly all the German patients were males.

Location. Of fifty-two cases, all but two were seated in the upper extremity. The arm proper (including the elbow joint) and the forearm were involved in about equal degree. Lesions of the upper arm were limited invariably to the lower third. It would seem that in the majority of the forearm cases the lesion was near the middle; both bones

were usually involved. In the minority of cases the lesions were seated in the upper or lower third of the forearm.

Character of Injury. In the vast majority of cases this was a fracture.

General Results Independent of Treatment. It is difficult to determine this. Of fifty-one cases in which the result is stated, we find complete failure in ten, some improvement in fourteen, and a relatively good result in twenty-seven. The latter implies more or less return of function. Even in cases with a naturally poor prognosis time often accomplishes much. In but few cases is the end-result noted.

General Results as Based on Treatment. Operative procedures in the main are limited to cutting operations, tendon lengthening, resection of bone, and, in a few cases, tenotomy (the two lower-limb cases) and the resetting of badly healed fractures. In twenty-two cases treated by operative procedure a good functional result seems to have been secured in the majority. In thirty non-operative cases (simple tendon stretching being placed here) good results were secured in a minority only, and in several of these improvement was only apparent after many years of observation.

Alex. Hugh Ferguson in a recent original communication (Western Canada Medical Journal, January, 1908) states that ischemic atrophy and paralysis occurs in muscles from which the blood supply is more or less cut off and may be due to the following causes:

1. *Arterial*—depending on two causes: (a) Interruption must be nearly complete; (b) interruption must be of more than two or three hours' duration, otherwise it is easily tolerated—sometimes incomplete interruption for several days.

2. *An Interrupted Venous Return.*

Causes. 1. Embolus—cardiac.

2. Thrombus—syphilitic endarteritis, or following acute infectious disease.

3. Raynaud's disease—chânges in vessels due to defective nerve innervation.

4. Direct injury to a vessel.

5. Cold.

6. Most common of all—*tight splinting.*

He gives the following symptom-complex and pathologic anatomy:

Paresthesia—numbness and tingling in parts of limb affected, and perhaps combined with alternating sensations.

Severe and often paroxysmal pain in muscles followed by cramps and spasmodic jerkings.

Limb often pale, but sometimes cyanosed and cold.

Electric irritability of muscle lost after ischemic condition has lasted five hours, and the muscles are quite flaccid and powerless, as seen in operations after prolonged use of Esmarch's bandage.

After seven hours, muscular rigidity and painful contractures begin. These increase in severity, but disappear in two or three days, leaving muscle again flaccid.

Oedematous condition from more or less established collateral circulation. Muscles now tender on pressure.

Swelling gradually disappears; muscular atrophy becomes manifest, muscles being hard and firm.

Contractures follow—hand flexed at wrist, and fingers at phalangeal joint. Final contractures due to atrophy of muscles and overgrowth of fibrous connective tissue.

Atrophic changes in the skin often present.

Course—This depends upon the duration of the primary ischemic condition. When cramps and rigidity have set in, probably no immediate recovery of the muscle is to be looked for, but short of this the muscles may readily recover, if the blood supply is restored.

In cases where cramps have appeared, it is probable that many of the muscular fibres die, and have to be replaced by regeneration—a long and slow process, or by repair.

When ischemia is of greater duration, and the muscles have become flaccid, it is not probable that any great amount of restitution can occur. However, certain fibres may have escaped, and from these new fibres may be formed, but the amount of recovery will be small. In such cases the muscles rapidly atrophy, becoming tough, hard and contracted.

Pathologic Anatomy. A. If blood supply is completely interrupted.

1. Muscle is gray, dirty yellow color, dull in appearance and friable.
2. Almost complete absence of muscular nuclei.
3. Usually no fatty degeneration.

B. If blood supply is partly interrupted.

1. Muscle firm and tough; more or less normal in appearance.
2. Under microscope—great increase of fibrous connective tissue between bundles of muscular tissue and between individual muscle fibres and cells.
3. Fibres have lost their polygonal form; are smaller and rounder, but maintain their striae even under extreme atrophy.

Lorenz in 1898 gave a very careful description of the clinical phenomena attending this form of paralysis, describing the true Volkmann type as always resulting from over-tight splints or dressings usually after a fracture, but stating, however, that the symptoms are the same whether the condition is brought on as a result of disease of ateries (such as trauma, embolism, thrombosis, etc.) or exposure to cold. He described the development of the condition as follows:

Very soon after the splints or bandages are put on the injured limb, the patient suffers pain, and the portion of the extremity which is free begins to swell. The pain and swelling increases steadily and if the bandages or splints are not quickly removed, the muscles become rigid and begin to contract. It will be found at this time that the muscles are very sensitive and that occasionally paresthesia exists. After the bandages have been removed, the muscles swell; indicating the development of myositis. This swelling subsides after several days and the muscles become permanently shortened and cicatrized. If the bandages are not removed within five hours, this rigidity which has been described as corresponding throughout to rigor-mortis is sure to supervene and having once developed, the muscle is lost although it need not become gangrenous.

As to the condition being caused by the application of Esmach's bandage, Powers states that where this was assumed to be instrumental as a causative factor its application was followed by the use of splints and bandages. Also that in nearly one-half the cases there was a fracture at the lower end of the humerus which leads to the suspicion that in some instances the brachial artery may have been compressed between the splint and the lower end of the shaft of the bone. Powers' paper, in fact, gives the most comprehensive and careful summation of the literature on this subject that has as yet appeared. We shall take the liberty of quoting him again in the consideration of the medico-legal aspect of this condition. It did not occur to Volkmann or to Leser that

operative measures could be employed for the relief of this condition. The first tendon lengthening was done by Davidsohn in 1891. In 1896 Henle excised 1.5 cm. of the radius and ulna; this being the first resection done for the relief of this condition. Since these two operations, the operative treatment of this condition has come into recognized standing and general use.

Tendon lengthening and bone resection have been discussed quite recently by Kleinschmidt (Deutsch Med. Woch., November 17th, 1907, No. 17, p. 679). He states that in cases of not severe contracture, it is his habit to treat them with massage and muscle stretching, but in severe contractures, he believes in the exsection of bone or the lengthening of tendons. In one of his cases he removed 3 cm. from the radius and ulna and established a good result.

Hoffmann (Zeit. für Ortho. Chir. Bd. 19 H. 1-2) reports a case of fracture of the lower third of the arm followed by an ischemic paralysis of the forearm; the hand being held in a position of right angled flexion and held stiff; the fingers were slightly flexed at the proximal joints, and there was very slight motion. The treatment consisted in operative lengthening of each of the shortened muscles and although the operation was difficult and tedious, the result was excellent.

Zoppi (Tipogr. Bardellini-Legnago, 1907) reports a case of supination of the left forearm after an old fracture of the elbow joint; the hand being much atrophied, the fingers and wrist joint held in extreme flexion, and ankylosed, active movement very slight, sensation undisturbed. A plastic operation was done on the tendons and the ankylosis was broken up manually. This was followed by placing the hand in extension and later by active and passive movements with a return of function.

Blenke (Muench. Med. Woch., 1907, No. 2, p. 100) reports a case of ischemic paralysis following a fracture of the forearm; the hands and fingers being flexed and motionless. He removed here 1.5 cm. of the radius and ulna; the bones being united with silver wire. The end result was a return of function.

Hildebrand (Sammlunk Klin. Vortrage N. F. No. 437, Chir. No. 122) has written an article on the knowledge that exists on the subject of "Ischemic Muscular Paralysis and Contractures." He states that in the great majority of instances the injuries which proceed this paralysis are of two types; the first a fracture of the lower end of the humerus and the second fracture of the forearm. He collected thirty-five cases of the first injury and eighteen cases of the latter.

Hohmann, of Dusseldorf, reported a case at the Congress of German Orthopedic Surgeons during the last year as follows:

A young girl with ischemic muscular contracture of the forearm following a supra-condyloid fracture of the humerus, which presented severe contracture of the flexors of the hand. Hohmann operated six and one-half years after the injury, lengthening the flexor tendons and obtaining an excellent functional result. The etiology of this case is interesting in that the fracture was located opposite the bifurcation of the brachial artery. The process of healing involved the artery, so that pulsation could not be felt below the injury; the circulation being carried on collaterally.

Ischemic paralysis and contracture is a condition which is fortunately rarely seen. It seems fitting, however, to call attention to its importance, medico-legally speaking. From Powers' recent article we quote the following:

"In regard to the medico-legal aspects of Volkmann's contracture, Kriege writes as follows: 'The contracture occurred, as a rule, in children who had sustained uncomplicated fractures of the upper extremity. Plaster of Paris was used more frequently than splints. In nearly every instance there were 'warning signs' that the dressings were too tight. The diagnosis presents hardly any difficulty, Volkmann having laid down the rules. As to prognosis, the severe type of contracture and the prolonged paralyses are practically incurable, but all cases demand patient and careful treatment.'

"The medico-legal witness has to determine the following: (a) Whether an ischemic paralysis or contracture is present. This should not be difficult on careful notation of the electrical behavior of the muscles. (b) Whether the tightness of the dressings was at fault or whether there was originally a lesion of the artery; this is decided by the presence or absence of the pulse beat below the fracture. (c) What are the disadvantages to the patient arising from the contracture? and (d) Whether the surgeon did or did not give to the case the care that his calling requires."

The literature on this subject as collected by Powers and Ferguson and including the cases which have appeared during the last year is as follows:

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PATHOLOGY AND BACTERIOLOGY.

IN CHARGE OF
CARL FISCH, M. D.

SERUM TREATMENT OF EPIDEMIC CEREBROSPINAL MENINGITIS.—Simon Flexner and J. W. Jobling (*The Jour. of Exp. Medicine*, Vol. 10, No. 9). —The work of Flexner on cerebrospinal meningitis was reported in the JOURNAL last year. This work consisted of original investigations of the biologic and other characters of the meningococcus that advanced our knowledge greatly. The report also contained information about experiments with an immune serum made from animals (monkeys, etc.), from which a prophylactic and apparently also curative serum could be obtained. The difficulty of determining the character of such a serum could not be overcome, but it seems that it is, after all, bactericidal. At the time this work was published, only a possibility of utilizing this serum in the human disease was expressed. The outlook was not good. The animal investigation had shown that the serum acted as a prophylactic and that, even within a short time after the infection, it would perhaps prevent further development of the disease. The conclusions to be drawn from this fact were that in the human disease this difficulty is almost impossible to overcome, on account of the rather late stage in which, in the majority of cases, the diagnosis is established. The period of incubation, so-called, that is the time in which, after infection, the disease progresses so gradually that subjective or objective symptoms are not noticed, is varying. With the appearance of the symptoms the stage of full establishment of the infection is always indicated; the organism is put to the work of inhibition, with other methods than it uses under normal conditions. If the organism is successfully assisted at this time by the serum, the chances are that with the sufficient degree of constitutional quality, it will give this work a chance to attain success. If, by systemic depression of the functional quality of the body, this work can not be done, as in previously weak individuals, or in later stages of the disease, such a serum can not help; on the contrary, it may lead to a hastening of the end. This great difference between the effect of antitoxic and bactericidal immune sera must be considered in the use of the meningococcus serum. Flexner has extended his work on 47 cases treated with his serum, of which 79.9 per cent died, and 20.1 per cent recovered. These cases were not submitted to treatment at the same period of the disease, so conclusions from the figures can not be made. There were, however, 18 patients treated in the so-called first three days of the disease with a recovery of 88.9 per cent, and a death rate of 11.1 per cent. While this last figure appears to be indicative of the beneficial

action of the serum, the number of observations is too small to draw conclusions. The character of virulence of the meningococcus varies greatly in different epidemics, and even without serum, the death rate, it is well known, varies remarkably. Flexner's work is immensely important, theoretically and practically, as indicating that the final victory in the fight against the pest is certain. For the present, as the author himself says, the knowledge is only empiric, and it will need a much more extensive comparison to establish the truth. So far, the results are of such nature that the use of the serum, with proper valuation of the individual quality of the single case, is definitely indicated, most likely allowing of a better prognosis, and, at all events, when used in the earliest stages, without apprehension of causing by its use aggravating or disturbing changes in the condition of the patient. The results of Wassermann and some others in Germany, from a serum prepared by Wassermann, are more limited in the number of cases, but point in the same direction as those of Flexner.

Experimental Lymphatic Spirillosis in Guinea Pigs.—W. Ch. White and Fr. Proescher (*Jour. Am. Med. Assn.*, 1907, Dec. 14).—The discovery of spirochætes in the tissues of cases of Hodgkin's disease, and of acute lymphatic leukaemia and chronic benign lymphomatosis, was reported in this Journal last year. The coincidence of this finding in different pathologic conditions in a tissue, about the pathologic processes of which, as yet, great confusion obtains, the clinical character of these processes, in many cases suggesting an infectious origin, was the factor that, from the beginning, suggested that the finding of these authors was not an accidental occurrence, but had an etiologic meaning. In their last paper, forming only a preliminary announcement of following detailed description, they give to the group of acute and chronic lymphatic leukæmia, Hodgkin's disease, chronic, benign lymphomatosis and lymphosarcomatosis, including chloroma and myeloma, the character of a primary lymphatic spirillosis. From a case macroscopically presenting the picture of tuberculosis, they injected, for diagnostic purposes, small fragments of the glands into a guinea pig. Microscopically, the finding was that of a lymphosarcoma. The animals showed no tuberculosis. After two months they showed greatly enlarged inguinal glands, and at the point of inoculation an ulcer. In the tissues, the microscopic structure was that of lymphoma with sarcoma foci, and immense numbers of spirochætes were found in them. Other guinea pigs and rats inoculated from this animal developed the same lesions. The ulcerations had the character of specific lesions, the enlargement of the glands was noticed on the 8th day after the inoculation. It appears that the work of the authors has opened a field that may overthrow many pathologic conceptions of tumor formation in lymphatic tissue, and at the same time contribute to establishing a clear idea of the character of the pathologic lymphatic processes, that in their transitions from one to the other have up to now remained an obscure problem.

On the Similarity Between Blood-Platelets and Certain Hematozoa.—Leroy D. Swingle (*The Jour. of Infec. Diseases*, Vol. 5, No. 1).—The work of Swingle is liable to throw doubt on many statements made by different observers on changes of hematozoa in the second host. For his studies he used the blood of sheep and, dealing with it as with cultures, he saw blood platelets change into forms not distinguishable from protozoal forms, with motion and flagellation; he obtained pictures that were in all points identical, for instance, with stages of piroplasma,

found by Koch and others in the tick. Even close to the double nuclear apparatus of these organisms the platelets showed the identical structure. The author has found that a "cultivation" of blood of a sheep and of other animals in a citrate of sodium and sodium chloride solution, shows always a protozoal change of the blood platelets. The pictures he gives are convincing and would suggest to an unprejudiced observer the character of protozoic structures. It really appears unlikely that structures found in the stomach and intestines of host insects of various human and animal protozoic infections should, without thorough critic on account of the ignorance of these changes in blood platelets, be taken for the mere post hoc propter hoc as expressive of a cycle of development of the infecting parasite. The author's observations, if confirmed, will necessitate a thorough revision of many theories and statements now current of the life cycle of protozoic parasites. The paper is an addition to Novy's work, who demonstrated that gross mistakes in following the life cycle of a protozoan through the second host can be made by not knowing that very similar parasites may continuously inhabit the intestinal tract. Swingle's work has again shown how difficult the work on protozoic life is, and how easily a mistake can be made by mere similarity and comparison.

DIAGNOSIS.

IN CHARGE OF
ALBERT E. TAUSSIG, M. D.

THE OPHTHALMOREACTION TO TUBERCULIN.—S. Cohn (*Berl. klin. Wochenschr.*, 1907, No. 47).—Cohn has obtained some interesting results with Calmette's conjunctival reaction to tuberculin, the development and technique of which is discussed in the last issue of this journal. Of 192 cases in which there was no reason to suspect tuberculosis, only 12 reacted positively. Of these last, 8 were cases of typhoid or paratyphoid fever and indeed of all the cases of typhoid fever so tested, two-thirds reacted positively. He suggests the possibility that typhoid patients as a class may be hypersensitive to tuberculin and that therefore the test may be inapplicable to them. Of 86 cases of tuberculosis, 23 failed to respond to the test, but of these all but three were in the terminal stage of the disease. It is well known that such patients ordinarily fail to react to tuberculin. Of 32 suspicious cases, 6 failed to respond and in most of these the hypodermic injection of tuberculin also failed to produce a reaction. His most important observation is concerned with the repetition of the test in the other eye. He instilled a drop of 1 per cent tuberculin into one eye and if no reaction appeared repeated the procedure after a sufficient interval with the other eye. In the non-tuberculous cases, the second test, too, was negative, whereas tuberculous patients almost always responded, the single exception being moribund. When, however, instead of being done with the other eye, the test was repeated with the same eye, practically every one responded positively. His conclusions are as follows:

1. With a 1 per cent tuberculin solution a positive conjunctival reaction speaks with very great probability for the presence of tuberculosis.

2. A negative reaction does not absolutely disprove tuberculosis, since half of all advanced cases of phthisis fail to react. Mild and moderately severe cases of phthisis rarely fail to respond.

3. Typhoid patients often react positively, especially during convalescence.

4. A hypodermic injection of tuberculin made some time after the conjunctival test may cause the local reaction in the eye to reappear or may cause a positive conjunctival reaction when the latter originally was negative.

5. The instillation of dilute tuberculin into one eye produces a hypersensitiveness of that eye to tuberculin in non-tuberculous adults. In tuberculous individuals, this hypersensitiveness usually extends to the other eye.

Cutaneous Vascular Dilatation in the Diagnosis of Incipient Phthisis.—Francke (*Muench. med. Wochenschr.*, 1907, No. 46).—In about one-fourth of all of his cases of early pulmonary tuberculosis, Francke found fine red lines, evidently due to vascular dilatation, in the skin over the affected apex. He interprets them as the cutaneous expression of localized tuberculous pleurisy and considers them as pathognomonic for the existence of a tuberculous process located in the peripheral portion of the pulmonary apex. The color, shape and number of these dilated streaks permit certain inferences regarding the age and the intensity of the infection.

Kernig's Sign in Meningitis.—Kernig (*Zeitschr. f. klin. Med.*, LXIV., Nos. 1 and 2).—Some 24 years ago, Kernig first called attention to his now well known sign in meningitis. Since that time he has tested thousands of cases of meningitis and of other diseases for the presence of this sign, with instructive results. In 208 cases of acute meningitis, 87 per cent showed the sign; the same was true in 94 per cent of his cases of epidemic cerebrospinal meningitis and in 91 per cent of tuberculous meningitis. On the whole, the more severe the infection, the earlier the sign appears. In other diseases, the appearance of the sign indicates an involvement of the meninges. Thus in a case of typhoid fever with positive Kernig's sign, the autopsy revealed a chronic leptomeningitis, and in a case of lumbar spondilitis, a spinal meningitis. It is less constant in children than in adults and cannot be elicited when paralysis sets in, but may reappear when the paralysis subsides. A negative test does not exclude meningitis, but a positive one indicates meningeal involvement with great certainty.

The Determination of the Right Border of the Stomach.—Sieving (*Arch. f. Verdauungs-Krankh.*, XIII., No. 4).—In determining the outline of the stomach after inflation, the chief stress is ordinarily laid upon the position of the upper and lower borders, the sinking of the latter below the level of the umbilicus, while the former remains normal, being usually considered indicative of gastric atony and often related to motor insufficiency. Sieving, however, considers the dermination of the right border of much greater diagnostic importance. The enlargement of the stomach to the right is, he believes, the earliest sign of motor insufficiency, and may be observed when only the pyloric portion is affected. At this time the lower border of the stomach still maintains its normal position. In health, the right margin of the stomach is situated some 6 cm. to the right of the median line, whereas in be-

ginning motor insufficiency the right border is some 9 cm. from the median line. In more advanced cases, where the lower border of the organ has fallen below the level of the umbilicus the right margin may be more than 9 cm. from the median line. In determining the gastric outlines, excessive inflation must of course be avoided.

THERAPEUTICS.

IN CHARGE OF
WM. ENGELBACH, M. D.

THE OPERATIVE TREATMENT OF PULMONARY TUBERCULOSIS.—Babcock (*New York Medical Journal*, November 16, 1907) referred to the failures attendant upon the operative treatment of tuberculosis of the lungs, and pointed out that the type of operations heretofore employed had been the same as those that had proved ineffective against tuberculosis of other organs. More thorough operative measures, with precautions to avoid any additional infection, might prove as valuable in the treatment of pulmonary tuberculosis as they had in treating tuberculosis of the kidney and other organs. The excision of entire lobes of the lung, and probably of all of one lung, Babcock maintained, was feasible through properly planned posterior incisions giving access to the root of the lung. Operative treatment was to be considered in selected cases in which hygienic and medicinal treatment proved adequate to arrest the progress of the disease, but impotent to overcome localized massive lesions which had already formed. In the case reported the left lung was almost free from disease, but there was a moderate miliary involvement of the right upper lobe, with massive caseation of the entire lower right lobe. Two months' open air treatment proved the patient's ability to overcome the lesser lesions, but death was inevitable from the condition of the right lower lobe. The lower lobe of the right lung, weighing 770 grammes, was therefore excised, the hæmorrhage being controlled by ligation of the vessels of the base of the lung, and the bronchus occluded by a flap of pulmonary tissue sutured over its lumen. The man's cough ceased, and nine days after the operation he was able to be out of bed. On the night of the tenth day he was left out of doors in a rain storm, through the carelessness of an attendant, and was seized with pulmonary edema, to which he succumbed on the fourteenth day. The portion of right lung remaining in the body was atelectatic and weighed 320 grammes, showing that life was maintained after the operation almost entirely by the left lung. This experience convinced the author of the feasibility of massive resection up to the removal of an entire lung. In a second case the patient greatly improved after a pneumotomy for large tuberculous abscess. To overcome the effects of the pneumothorax a new vacuum shield, designed to be placed over the chest wound during the operation for the reduction of intrathoracic pressure, was demonstrated. After extensive resections, if feasible, the pleural cavity should be closed under negative pressure. The divided bronchi could be occluded best by covering them with flaps of tissue. All portions of ribs should be removed from the flap in the chest wall and primary drainage of the pleural cavity avoided.

Neurasthenia and Chronic Suprarenal Insufficiency.—Schneider (*Revue de Medicine,* October, 1907) dwells upon the importance of careful examination of the various neurasthenics in trying to reach a diagnosis. Certain facts have recently been brought forward which suggest that lesions of the suprarenal glands may produce the phenomena which are common in neurasthenia. In its acute forms suprarenal insufficiency may take the form of pseudoperitonitis with sudden death, pseudotoxemia, pseudomeningitis, or pseudotyphoid fever, the diagnosis resting principally upon the two symptoms, asthenia and vascular hypotension. In the subacute and chronic forms there have been few reported cases, excepting those of E. Sargent and L. Bernard. In the paper by these authors the following symptoms are mentioned: 1. Circulatory troubles, including chilliness, small and unstable pulse, arterial hypotension, tachycardia, collapse, syncope. 2. Digestive troubles, including anorexia, vomiting, diarrhœa, and peritoneal symptoms. 3. Nervotoxic troubles, including encephalopathy, headache, excitement, delirium, convulsions, depression, coma, asthenia, and acute pains. 4. Hypothermia, anemia, emaciation and cachexia, and cadaveric odor.

Essence of Cinnamon Against the Grip.—Ross (*La Semaine Medicale,* November, 1907).—Grip, even moderately severe in character, is a disease giving rise to hyperthermia, which usually lasts from four to eight days, and to asthenia, which extends over a still longer period. According to the author, this phase of pyrexia and asthenia may be considerably reduced by the timely administration of the essence of cinnamon. The prescription should specify a preparation from cinnamon bark, the leaves being very much less efficient. The remedy is employed as follows: Begin by taking 12 drops of essence of cinnamon in a water or wine glassful of water, another and a third dose of 12 drops to be taken with an hour's interval between doses. Two hours after the last dose take 10 drops, and continue every two hours without interruption until the temperature has returned to normal. When apyrexia manifests itself it suffices to administer 10 drops three times daily in the next following 24 or 48 hours. When the disease is treated in this manner from the onset, namely, in the first three or four hours, the essence of cinnamon, so to say, aborts the hyperthermia in the space of 12 hours. If the treatment is instituted at a later stage, the temperature becomes normal only at the end of 24 to 30 hours. Under the influence of this medication the asthenia is modified to such a degree that the patient may, if necessary, go out and attend to his business from the second or third day of the treatment. However, it is preferable to wait until there have been two or three days of complete apyrexia.

Disinfection in Diphtheria.—The modern method of handling infectious material from diphtheria, the disinfection of comparatively harmless fomites while paying little or no attention to the virulent bacilli often carried about by those who have been in contact with the patients or by the patients themselves during convalescence, is criticised by M. Solis-Cohen (*Journal American Medical Association*). He uses the term latent diphtheria for those cases without pseudomembrane, but due to the specific diphtheria organisms. Twenty-seven cases are reported briefly, in nearly all of which presumed diphtheria germs were demonstrated, mostly by culture method. Mild atypical cases, he claims, are exceedingly common, frequently giving only the clinical picture of slight tonsilitis or pharyngitis, and even without any constitutional disturbance

whatever. These latent cases are largely responsible for outbreaks and epidemics of diphtheria; they are just as contagious as the acute membranous type and call for the same precaution. Tonsilitis and pharyngitis should be included therefore in the notifiable diseases, and at least two negative throat cultures be obtained before any patient in whose throat virulent bacilli have been found shall be allowed to go at large. While there is a disagreement of authorities as to the distinction between the diphtheria and pseudodiphtheria bacilli, the error, if any, should be on the safe side. Nevertheless, Solis-Cohen thinks that the health authorities may properly disregard the presence of diphtheria-like bacilli in the throats of healthy persons who have not been in direct or indirect contact with a case of diphtheria, membranous or latent, and who have not themselves suffered from sore throat. Otherwise they should, in his opinion, be subjected to same restrictions as infected contacts residing in the same house with a diphtheria patient, i. e., be excluded from school or work and not permitted to frequent public places until two successive cultures have proved negative. Every one who has been in contact with the patient, whether at home, at school or at work, should be examined bacteriologically. Disinfection of fomites and terminal disinfection of rooms and their contents is insufficient and reliance thereon treacherous. Animate carriers of infection are much more dangerous than the inanimate. He would not dispense with terminal disinfection, but would postpone it until after all the members of the household have been examined bacteriologically and found free from germs.

A New Liver Ferment.—Leyden and Burgell (*Deut. Med. Woch.*) describe experiments on a new ferment extracted from liver juice, which appears to have a selective action in producing lysis of cancer cells. In regard to the selective action of various agencies influencing the cells of malignant tumors, they say that the effect of radiation with the Roentgen rays involves very slight selective action, the injection of radioactive substances is accompanied by a temporary and non-progressive action, and in pacreatin action the selective property is very incomplete. Although the selective action of the liver ferment is pronounced, there seems but little prospect of being able to make use of it therapeutically owing to the uncontrollable nature of its action. It is suggested that the unrestrained growth of malignant tumors depends on a deficiency of the body in a lytic property that probably is specific. That is, the healthy individual possesses a ferment-like body which is absent or is not present in sufficient amount in the carcinomatous organism.

SURGERY.

IN CHARGE OF
MALVERN B. CLOPTON, M. D.

The Practical Application of Local Anesthesia in Fractures. —(*Lerda, Zentralb. f. Chir.*, 1907, No. 49).—The use of the local injection of cocain between the ends of fractured bones was first suggested, in 1885 by Conway, and more recently advocated by Reclus; the latter first used it to allay pain in a patient being transported to the hospital. Braun has advised its use in fractures of the skull, collar bone and rib. The advantages over general anesthesia (which most of the

cases are not prepared to take), are that it relieves the pain, while reducing the fracture, and is not accompanied by the excitement of the general anesthesia, so that retaining dressings can be put on without fear of displacement from excessive muscular activity at the time of dressing, or later. A syringe armed with a long, strong needle is used to inject the cocain between the fragments and tangential to the break. A 1 per cent cocain in normal salt solution with adrenalin is used. Stovain and alypin have been tried but much larger injections have to be made than with cocain. The adrenalin prevents, in part, the formation of hematoma. Five to eight cubic centimeters of the solution are injected. Relief begins shortly and in ten minutes the fracture can be painlessly manipulated, with no muscular spasm; in fact just as well as if under general narcosis. It is applicable to most fractures. Those mentioned by the author are Colles' fractures and other fractures of the forearm, elbow fractures, fractures of the lower leg and as is particularly mentioned, supramalleolar fractures, where it has always been contended that general anesthesia is essential. Nose breaks can be painlessly and esthetically manipulated and reduced.

Spinal Cord Paralysis.—Krause (*Arch. f. Clin. Chir.*, Bd. 84, hft. 2). —In order to help in a finer differentiation of the causes of paralysis from localizable pressure on the cord, Krause reports six cases he operated on in a series of 22 in which a diagnosis of tumor of the cord had been made, but when laminectomy was performed proved to be a localized collection of cerebrospinal fluid under great pressure. The first case was in a man with a tuberculous kyphosis of the dorsal region and a history of syphilis several years before. The diagnosis of a spinal tumor was made on account of the excruciating girdle pains in the right chest, which did not cease under strong antisyphilitic treatment. The case at this time was in the hands of another surgeon who exposed the dura at the second and third dorsal segment, but did not open it because he could feel no growth beneath, and closed the wound after dividing the posterior nerve roots. There was little or no improvement and after five years the patient returned for another operation. The dura was exposed from the first to the fourth dorsal, which showed as a tightly-stretched membrane. After opening the dura the cerebrospinal fluid came out in great quantity, enough to fill the wound two or three times. It was clear and normal, the arachnoid was œdematous, and a few adhesions seemed to limit the distended dural sac above and below. The wound was closed with a small drain coming from the dura into the muscle. After the operation the improvement came shortly, pain left and reflexes became normal. The case is regarded as a chronic inflammatory process of meninges in which the inceased fluid was held localized.

The second case was a 35 year old man who had tuberculosis of the lung seven years before, with a more recent development of the Brown-Sequard paralysis. The trouble began over a year before with formication over the left foot and leg, and in a week involved the whole leg and the left lower part of the abdomen, the bladder pained and pain came in the left half of the penis and scrotum. After some months the pain went to the right leg; a little later the right shoulder blade and arm became involved. At the time of operation there was a spastic paralysis of the right leg with Babinski and Oppenheim reflex. On the left leg and up to the sixth left rib there was hypalgesia and thermhypesthesia. On the right back from the fifth rib down, tactile and pain sense lost. The provisional diagnosis was either extradural tumor of third dorsal vertebra, or caries

of spine with pressure from behind and on the right side. At the operation the 6 cm. of the dura were exposed in the upper dorsal region; it was much distended and did not pulsate. On opening the dura a large amount of clear spinal fluid came out, and adhesions were shown between the cord and arachnoid. The diagnosis of adhesive arachnoiditis with increase of cerebrospinal fluid, was made. The patient died shortly after the operation.

Another case in a woman of 60 years, who had symptoms of compression of the cord (paralysis of the bladder and paraplegia) which had lasted for three months. There was a swelling over the lumbar spines, which on opening was shown as a tuberculous abscess which had arisen from the spinous and transverse processes of the third and fourth lumbar vertebrae. These were removed and cleared away to expose the canal, which did not contain pus or granulation tissue, but above was seen a much distended dura, which contained clear cerebrospinal fluid under tension. This was not opened, but with the healing of the abscess the patient made such improvement that she was able to be about.

A case is related, in a 53 year old woman, diagnosticated tumor of cord at the 8th cervical segment by Oppenheim and Palczek. The Brown-Sequard paralysis was not fully developed. The operation disclosed a much distended dura full of spinal fluid with some adhesions. The wound did not heal entirely, but for 18 months discharged cerebrospinal fluid. However the paralysis disappeared.

Another case reported is a man of 50 years, who for two months had a severe attack of pain in the groin with later an involvement of the lumbo-sacral nerves and a loss of tendon reflexes of the lower extremities. The canal was opened in the lumbar region and an exostosis of the lamina of the 4th lumbar vertebra was found pressing on the cauda, while above this the dura was very tense and filled with clear fluid. After the operation of removal of the bone and opening the dura the reflexes were lost below, but sensation perfect. The patient died on the 10th day without any infection having arisen.

To account for the origin of these collections of fluid he takes Henle's description of the arachnoid as a porous, fluid-soaked membrane which permits the free passage of the spinal fluid through it, but should it become, from any cause, an impermiable membrane it dams up these localized collections, which, in the brain, cause cysts, but in the spinal canal cause collections which may extend over an area measured by several vertebræ.

The etiology of this condition is usually found in an infectious process in the neighborhood of the dura, or it may be due to gout, as in one of the cases, or to syphilis as reported in two of the patients.

Lumbar puncture for diagnosis is not indicated. A case is recited of a youth, who had a fall with a cervical contusion, that later gave symptoms of compression of the cord. A lumbar puncture was negative, but at operation the cord was found compressed by this "meningitis serosa spinalis," it was opened, but at that time no fluid came from below though some escaped from the upper part of the cord.

While puncture of the subarachnoid space in the region of the compression might be easy, the diagnosis is not complete should fluid in large amounts come from the needle, because in all cases of tumor of the cord that Krause has operated on he found a general increase of fluid with distension. In order that the tumor should not be missed a laminectomy must be made.

PEDIATRICS.

IN CHARGE OF
ALFRED FRIEDLANDER, M. D.

TREATMENT OF INFLUENZA IN CHILDREN.—Breton (*Rev. Mens. des Mal. de L'Enf.*, November, 1907), discussing an epidemic of influenza in children, makes the following suggestions, with reference to treatment:

During epidemics, the isolation of grippe patients is recommended, even of convalescents. Disinfection of the rooms is of value. Even with many patients ill in one family their separation is advisable; because some cases run a much simpler course than others. Great care is to be exercised concerning the first outing of these patients. There is special danger not only of relapses of the influenza but of certain sequelæ, of which pulmonary congestion is the most common. For the gastro-intestinal troubles, absolute limitation of diet or restriction of all food, save water, is of great value. For the pulmonary troubles, hot packs, mustard sinapisms or hot baths are recommended. The author finds the phosphate of guaiacol of great value in the treatment of influenza, given in doses of four to seven grains per diem, according to age. Convalescence is to be watched very particularly and signs of fresh infection are to be carefully searched for. For the adenopathies, the author finds raw bone marrow of great value.

ALIMENTARY REGIMEN IN SCARLET.—Courdouan (*These de Paris*, 1907) as the result of a series of careful observations, concludes that chloride of sodium does not play as important a role in scarlet as is ordinarily supposed. There is no retention of the chlorides in scarlet, and salt added to the food is without influence on the initial albuminuria, and appears to play no role in the contraction of the later nephritis. The curve of chloride elimination is identical under different dietetic regimens, and the initial albuminuria disappears at about the same time, no matter what the diet. No form of diet can absolutely prevent the occurrence of nephritis. Milk diet is unquestionably insufficient, and causes loss of weight; but in all cases in which the urine cannot be very carefully watched a milk diet should be instituted. So too in all cases of scarlatinal nephritis milk should be the sole diet. Under other circumstances ordinary diet with an ordinary amount of salt, may be used as it is more comfortable for the patient, harmless and prevents undue loss of weight.

NEPHRITIS IN INFANTS.—Carpenter (*Brit. Jour. Children's Diseases*, October, 1907) finds that cases of infantile nephritis are very apt to be overlooked clinically, inasmuch as extensive kidney disease may exist in infancy without dropsy. It is also a peculiarity of infantile nephritic kidneys, whether of syphilitic or simple origin, that they frequently appear normal macroscopically even though they are extensively diseased. Though some cases of infantile nephritis are undoubtedly syphilitic, others are certainly not so, and it is doubtless true that interstitial nephritis may be produced by toxins other than those of congenital syphilis. It is possible that the interstitial nephritis may thus begin in very early life, being due to the presence of intestinal toxins. The combination of parenchymatous and intestinal inflammation is apparently not uncommon in the nephritis of infants.

Acute Hemorrhagic Nephritis, After Mumps, in a Seven Months' Old Infant.—Jelski (*Arch. f. Kinderheilk.*, Vol. 47, page 164) reports the case of a seven months infant who had a moderately severe parotitis. Two weeks after the onset it was noticed that there were bloody specks on the diaper. Examination of the urine showed the picture of an acute hemorrhagic nephritis. Despite energetic treatment the child died with a picture of uremia. Careful search of the literature showed the author that the cases of nephritis following mumps in childhood have occurred in older children. It is noteworthy that three other children in the family, who had mumps at the same time, showed no complications.

Empyema in Nurslings.—Douriez (*These de Paris, Arch. Enf.*, November, 1907) shows that purulent pleurisy is not exceptional in nurslings. It is secondary to pulmonary infections. The pneumococcus is the principal agent in the place of the streptococcus, which plays the principal role in the empyema of the newly born. The diagnosis is to be made only by the subjective signs, the most important physical sign being flatness on percussion. Exploratory puncture often establishes the diagnosis and permits a bacteriologic examination. Difficulties in diagnosis arise with reference to the distinction between bronchopneumonia or even lobar pneumonia or pulmonary tuberculosis. The prognosis is always grave; practically always fatal in streptococcal empyema, not quite so bad in the pneumococcus empyema. Treatment should consist at first, in thoracentesis, which may be repeated in the pneumococcus empyema. Rib resection in the nursling, is a distinctly dangerous operation and should not be resorted to unless other means fail.

OPHTHALMOLOGY.

IN CHARGE OF
JOHN GREEN, Jr., M. D.

Extirpation of the Gasserian Ganglion and Neuro-Paralytic Keratitis in Man.—Weiss (*Klin. Monatsbl. f. Augenh.*, August-September, 1907).—Four years after extirpation of the left Gasserian ganglion, Weiss's patient suffered from excessive sweating of the face, especially on the right side, occasional pains in the left eye, and want of sensation in the left conjunctiva and left side of the mouth. The distribution of the left fifth nerve was anesthetic. There was slight drooping of the left upper lid and fine fibrillary tremor of the left orbicularis. The left cornea was absolutely insensitive, but transparent and showed no trace of old inflammation. Although in the course of his work the patient's eyes were exposed to the risks of dust and other foreign bodies, the anesthetic cornea had remained free from inflammation.

The author rejects the "trophic" theory of Magendie as well as the newer "trophic" theory which attributes the lesion of the cornea to paralysis of sympathetic fibres which have joined the fifth nerve and which undoubtedly are liable to be involved along with the latter. He believes that drying of the cornea from insufficient covering combined

with the occurrence of small injuries which provide a point of attack for pathogenic organisms are enough to account for all cases of keratitis resulting from extirpation of the Gasserian ganglion. That keratitis occurs so seldom in these cases is due to the fact that the activity of the reflexes in the healthy eye insures the continuance of winking movements and of secretion of tears in the affected eye.

The author believes that the operation for removal of the ganglion can never be contraindicated by the danger of keratitis.

The Etiology of Ophthalmia Neonatorum.—J. Wharton (*Ophthalmic Review,* November-December, 1907).—From an investigation of 100 cases the author reaches the following conclusions respecting the etiology of ophthalmia neonatorum: (1) The majority of the cases (75 per cent in the author's series) result from an infection with the gonococcus and the inflammation is usually severe. Other organisms, notably the pneumococcus, may cause a milder form of inflammation. (2) The source of infection is usually an abnormal secretion present in the vaginal tract of the mother. Especially is this the case among infants with gonorrhœal ophthalmia, for leucorrhœa is frequently gonorrhœal in origin. (3) The absence of a vaginal discharge, a leucorrhœa, does not necessarily indicate the absence of gonorrhœa. A gonorrhœal conjunctivitis may appear in the offspring of a mother who "thinks" she is quite healthy. The mother's history, certainly among the poorer classes, must not be relied upon, and a rigid prophylaxis should be observed in every confinement. (4) Infection may arise as a result of an inoculation of the conjunctival sac with sputum, filth, etc.

Contribution to the Etiology of Trachoma.—Halberstaedter and Browazek (*Deut. Med. Woch.,* 1907, p. 1285).—The authors found (while engaged in investigations on trachoma in Java) mostly in the neighborhood of the nucleus of epithelial cells of the trachomatous conjunctiva, round or oval, not perfectly homogeneous, masses staining blue or violet with Giemsa, and in these sharply defined, very fine corpuscles, staining red when free, violet when covered by the blue masses. At later stages the corpuscles divide like cocci and present pictures similar to diplococci. The authors consider the corpuscles as parasites, the blue staining masses as products of reaction of the cells, caused by the entrance of the virus, for the following reasons: (1) They were always seen under the microscope in the same distinct characteristic manner and showed lively movements. (2) They could be inoculated on the conjunctiva of anthropoid apes, in the epithelia of which they were found in great masses, and could be further propagated from ape to ape. Inoculations on other animals were negative. According to the authors, these microorganisms may have an etiologic connection with trachoma and may, together with the morbid agents of variola, vaccine, scarlet fever, chicken-pox, icterus of the silkworm, and perhaps the pox of carps, belong to a group for which they propose the name "chlamydozoa."

The corpuscles correspond with those found by R. Greef and Frosch.

A New Procedure for Treating a Prolapse of the Iris Complicating Penetrating Wounds of the Cornea.—Heckel (*Penn. Med. Jour.,* August, 1907).—The writer uses a solution of eserin sulphate one grain to the ounce before removing a prolapsed iris. After cutting the iris tissue close to the cornea, he passes a small horn spatula into the corneal wound, permitting the iris, aided by the miotic action of the eserin, to withdraw into the anterior chamber. After twenty-four to

forty-eight hours he uses atropin. He adopted this procedure as a result of his observations that mydriatics will not dilate a pupil when there is an open or leaking anterior chamber, and thus draw the iris away from the wound, while miotics will act with an open corneal wound.

DERMATOLOGY AND SYPHILIS.

IN CHARGE OF
J. J. HOUWINK, M. D.

BASALZELLENKREBS.—P. Clairmant (*Archiv. für Klinische Chirurgie,* October 19, 1907).—Carcinomas developing from the basal or deepest layer of the epidermis retain the characteristics of the columnar cells of this layer. They have no tendency to horny changes like the carcinomas developing from the prickle cell layer. They are curable by X-ray treatment, while the horny carcinomas are not affected by Roentgen. Microscopical diagnosis should therefore be made before deciding upon treatment. However, the clinical appearance of these carcinomas is quite typical. They form sharply circumscribed tumors of irregular outline raised above the level of the surrounding skin. The surface is only partially ulcerating, if at all, the rest being covered with a fine skin in which small vessels can be seen. If there is extensive ulceration, the ulcerating part will be found lower than the rest of the tumor, but never presents a crater-like appearance. The ulceration is always irregular with a papillary surface. The borders of the tumor are yellowish-red or yellowish and transparent. Bleeding occurs easily, the secretion is more serous than purulent. The lymph glands are not enlarged. A clinical diagnosis can therefore most often be made.

NOUVELLES NOTES SUR L'ATOXYL.—Hallepeau (*Bull. de la Société Française de Dermatologie et Syphiligraphie,* November 7, 1907).—Hallepeau reports a case of syphilis treated only with atoxyl. The patient, a student of pharmacy, 22 years old, contracted a leutic chancre on the twelfth day of May, 1907, which made its appearance on the internal side of the prepuce. As soon as the diagnosis was certain, patient took 250 milligrams of atoxyl daily for one week, and the next week the same dose every other day. The chancre disappeared entirely during this treatment, leaving a smooth scar. Patient stopped every treatment, still he was watched very carefully. After four months, on the twelfth day of September a macular eruption appeared all over the body and some mucous patches in the mouth. Patient took for five days the same dose of atoxyl, under which treatment every symptom of lues disappeared. Lately a mucous patch appeared on the pillar of the soft palate, disappearing after four doses of atoxyl. No bad effects of the medicine were noticed. Hallepeau concludes from this case that atoxyl has a powerful action on the spirochatæ and that, when given in high doses, the manifestations of the disease are retarded and easily made to disappear.

THE STAINING METHOD FOR SPIROCHETAE IN SECTIONS.—F. Proescher and W. C. White (*Jour. A. M. A.,* December 14, 1907).—A rapid method to stain spirochætæ in sections, giving clearer and more constant

results, is described in this paper. As the silver method is a very lengthy one, the method of the writers may be considered as having some advantages. Their procedure is as follows:

1. Harden in alcohol or formalin.
2. Embed in paraffin; cut in usual way or make frozen sections.
3. Stain in picric acid and acid fuchsin solution 10 minutes (saturated aqueous picric acid solution 99 c.c. and saturated aqueous acid fuchsin solution, 1 c.c.).
4. Differentiate in 20% solution of picric acid in 96% alcohol, 5-10 minutes.
5. Dry with filter paper on slide.
6. Clear in xylol.
7. Mount in Canada balsam.

The spirochætæ are stained deep red. The other tissue, except the fibrous tissue and reticulum, is stained yellow. Fibrous tissue and reticulum are stained red, but not such a deep red as the spirochætæ.

The method may be used for rapid diagnosis of spirochætæ in fresh tissue, the whole operation requiring not more than twenty minutes if the tissue be hardened in hot formalin solution and frozen sections be made.

Frost-Bite, Treated by Artificial Hyperæmia.—Ritter (*Archives of the Roentgen Ray*, November, 1907).—Remedies against frost-bite are like the sand on the seashore, which means that the remedies go for the most part for nothing. The old theory was that the hyperæmia which is found in frost-bite acts injurious, being practically the first stage of inflammation. Accidently Ritter treated a boy suffering from frost-bite and tuberculosis of the hand with Bier's stauungs-hyperæmia and noticed that the frost-bite improved rapidly under this treatment. Since then he treated over 150 cases of frost-bite with Bier's hyperæmia, mostly with "obstruction hyperæmia" by means of a ligature, but in case of anemic patients with active hyperæmia produced by heat to the part treated.

Every one of his cases showed rapid improvement and cure in a short time. He concludes from the results of this treatment, that the hyperæmia in frost-bite is not harmful and not a direct result of cold. The object of the hyperæmia is to protect the tissues injured by frost with a greater supply of blood, and to promote regeneration of the part. Accordingly, it is of service to increase this natural means of cure on the part of the body itself in cases of frost-bite.

Regarding the technique, Ritter recommends a hyperæmia of six to twelve hours per day. Best of all is hyperæmia produced by strong heat, causing edema. Heat is best applied by means of a hot air apparatus and of most benefit in chronic cases. The frozen parts are first rendered bright red, then they become deep blue-red and often blackish blue. A moist dressing assists the action of the hyperæmia greatly.

CORRESPONDENCE.

LONDON LETTER.

(FROM OUR OWN CORRESPONDENT.)

One of the burning questions of the hour centers upon the "brown dog" of Battersea. This is really due to one of the pleasing methods adopted by the anti-vivisectionists to give effect to their peculiar views. One or other of the societies—for we are happy in the possession of some three or four separate organizations whose tribal warfare even their common object cannot abate to any extent—erected last year in Battersea Park a statue with an inscription to the effect that it is "in memory of the brown terrier dog done to death in the laboratories of University College in February, after having endured vivisection extending over more than two months." In the light of the facts elicited at the trial in which the original allegator of this statement was cast in heavy damages, this inscription can only be described as lying and distinctly provocative of a breach of the peace. The students of University College in their wrath have vowed destruction to the offensive insult, and in the unreasoning fervor of youth attempted to take the law into their own hands, but were foiled. The magistrate before whom they were arraigned took the opportunity to gain some cheap applause at their expense in the colums of the "gutter press," and this naturally has not tended to allay the inflammatory condition of things. The upshot of the matter will be that action will be taken by the representative in Parliament for the University of London, Sir Philip Magnus, to get the objectionable inscription removed, unless in the meantime the municipal authorities of Battersea, in whose charge the spiteful production was placed, see fit to do so themselves, and save the expense of a special night and day watch over a tempting cock-shy.

The President of the Board of Education has issued a memorandum to the various local authorities dealing with the Act coming into force with the new year which secures the medical inspection of children attending the public elementary schools. Mr. McKenna has decided against the establishment of a separate and special department, pointing out that, as the work is an integral factor in the health of the nation, it must be carried out under the direct supervision of the medical officer of health. This will have somewhat far-reaching effects, as it will in the first place wake up the local authorities in some parts of the country to a sense, till now neglected, of their proper duties as regards public health; it will eventually bring about a removal, much to be desired, of the medical officers of health from the conflicting calls of private practice, for with the best will in the world, the temper of an angel, and the tact of a skilled diplomatist, it will be impossible for a medical officer of health who is also engaged in private practice so to order his new duties of school inspection without involving himself in continual false positions; finally the combination of duties must and will undoubtedly make the public health medical service a government appointment, and thus free the holders from the whimsies and prejudices of local bodies. The memorandum has already been labeled as socialistic; if by that is meant merely a development of sane and sober collectivism there is no harm in the term, but the word has, quite unjustly, come to bear rather an evil reputation, albeit the medical profession is itself directly responsible for initiating the collectivist method of dealing with public health questions.

An important discussion took place in the General Medical Council on the subject of dealing the practice of medicine and surgery by unqualified persons. There is no doubt that further powers are urgently needed in order to cope with the present abuses, which not only affect the interests of duly qualified men, but directly concern the lives and health of the public itself. A committee has been appointed to collect information bearing upon the point from foreign countries and to consider what steps can be taken to procure effective legislation. It is to be feared, as the President pointed out, that not much can be hoped for from the Legislature to improve matters. Perhaps some day we may be able, as a profession, to present as united a front as our legal brethren; then something will be done.

The Annual Meeting of the Fellows and Members of the Royal College of Surgeons of England differed somewhat from previous gatherings of the same sort, in that the Council had to say something to justify its attitude of silent opposition to the resolution passed with monotonous regularity at each meeting for some years past, in which the Members demand representation on the governing body of the College. This body, the Council, is entirely composed of Fellows, so that the Members, though by far the more numerous, have no voice whatever in the management of affairs. As a sop to Cerberus the Council has decided to submit for the consideration of the Members the question as to whether women should be admitted to the College examinations. This is a very wily move, for the subject is capable of provoking torrents of eloquence, more or less, on either side which will haply postpone any definite decision for some time to come.

It is very gratifying to all those who have been supporting Mr. Haffkine in his tussle with the Indian Government to know that he has succeeded. In the letter he has received from Mr. John Morley, the Secretary of State for India recognizes that an important body of scientific opinion is favorable to him and offers him on honorable terms renewed employment under the Indian Government. Mr. Haffkine has accepted this offer and proceeds to India as soon as possible to take up again his important work of bacteriologic research—work which in India is even of greater importance than in other parts of the world. It may be remembered that the original trouble, known as the Mulkowal disaster, was the occurrence of fatal tetanus following the use of Haffkine's anti-plague serum which had been prepared at the laboratory under Haffkine's immediate superintendence. There was every reason for supposing that the contamination of the serum had taken place subsequent to issue from the laboratory; nevertheless an official inquiry laid the blame on the laboratory. The result was Haffkine's dismissal and a storm of indignation arose in consequence. As has already been pointed out, the matter has been settled most satisfactorily and the Indian Government is to be congratulated upon regaining the services of so eminent and so indefatigable a worker.

PARIS LETTER.

(FROM OUR OWN CORRESPONDENT.)

The phenomena which it is customary to group under the name of occultism have been kept, by the majority of savants, altogether too long in a state of systematic suspicion, so that the consequence has been a mystification of the phenomena and a retarding in the progress of their study. At the present time, it would be wrong to ignore completely

these phenomena, though that has been the idea until now. Since 1847, when at Hydesville, N. Y., certain singular facts were noted from which was evolved the study of spiritualism, many researchers, savants of unblemished reputation, have interested themselves in the study of these phenomena, thereby placing them on a scientific basis. Mention of only the prominent investigators, such as Aksakoff, W. Crookes, Pierre Janet, Lombroso, Maxwell, Charles Richet, de Rochas, R. Wallace ought to suffice. Recently one of the most distinguished professors of the University of Montpelier, Dr. J. Grasset, has published a book with the significant title, "Occultism: Its Past and Present Significance." This work may be considered a classical treatise on occult science. In the wake of so good a guide as is this contribution, it is not impossible to adventure on safe ground, and to satisfy, without compunction, the legitimate desire inherent in all of us to get at closer range to those phenomena whose secrets have not as yet been explained by science.

Imprimis, the definition of occultism is of considerable importance. According to M. Grasset, it is a study of facts which do not yet belong to a positive science but are of such a character that they may do so one of these days. To put the matter succinctly: though occult facts are today only in the vestibule of the palace of science, their clamoring may soon effect a crossing of the threshold into the sanctum of scientific facts. Therefore we can say with impunity that at no distant day occult facts will become scientific. And to further this, the object of savants ought to be the complete transformation of mysterious phenomena into facts worthy of a positive science.

Just as astrology and alchemy are today replaced by astronomy and chemistry, certain phenomena which formerly belonged to sorcery, that is to occultism, have definitely been incorporated in the study of the psychoses, hysteria, somnambulism and hypnotism. From the other phenomena, although they are still considered mysterious, the right of a scientific interpretation should not be withheld. Granted that there has always been some sort of recognition of occultism with phenomena which have varied from time to time, the recent work of M. Grasset illustrates the present appreciation of the hitherto mysterious agents.

On account of the large number of persons interested in questions pertaining to occultism, it is difficult to arrive at convincing conclusions, or a just estimate of the weight and value of their criticisms. The reason for this is that it is impossible to reproduce voluntarily occult phenomena similar to methods pursued in connection with laboratory experiments. On the contrary to do this it is necessary to have a subject with the special aptitudes of a medium, and even then when the most favorable conditions are apparently realized, failure sometimes results. The frauds perpetrated by mediums should not be lightly considered, for they occur only too often. But though the fact of the frequency of these frauds is well established, it would be advisable to remember that not all mediums are frauds, or are always intentionally fraudulent, since it is known that certain mediums are not unaware, at times, of their own fraudulent practices. These frauds are, moreover, of two sorts: the sort done consciously and voluntarily, and the sort done unconsciously and involuntarily. We can readily see how errors may occur and how these errors complicate the problem.

In spite of the difficulties which beset the question, the fact that certain phenomena, but lately considered occult, have really been adopted by positive science is sufficient to encourage researchers. But

this should not be overlooked—that following M. Grasset's advice it is all important to draw the line between the study of facts and the discussion of theories. As to spiritualism, it is only a theory which aims to explain the occult phenomena by the intervention of the mind of deceased persons, reincarnated momentarily. But nothing is less demonstrable than this systematic explanation, nothing is more untrue. In every case the spirits should give proof of the proposition which they advance.

Less irrational is the theory of human radiation; and though at present it is not more firmly established than the theory of spiritualism, we are hopeful that some day science will explain the externalization of sensations and movement. In awaiting the explanation of facts that are demonstrable, it is important to establish the reality of these facts and make an analysis of them. The study of phenomena should precede the criticism of hypotheses. So soon as the facts shall be demonstrated, the promulgation of a theory will not be difficult.

The study of occultism should remain absolutely independent of all philosophical and religious doctrines. It is an illusion to believe that occult phenomena are dependent either on an apology for, or a refutation of, one of these doctrines. Researchers therefore need not take the aforementioned doctrines into consideration.

This then should be the mental habit of him who wishes to study and prove the reality of obscure phenomena such as telepathy, premonition, messages from a distance, and materialization; also of those demonstrations which are nearer: mental suggestion, nearby displacements without contact, levitation, rapping and clairvoyance. M. Grasset is of opinion that it is not rationally impossible and not unworthy of savants to engage in the study of these important questions. In fact he is bold to state that it is their duty to study them because before long many of these phenomena will cease to be occult.

January 10th.

OBITER DICTA FROM FOREIGN JOURNALS.

THE PHYSIOGNOMY OF THE SICK.

Prof. Wm. Ebstein in a recent number of the "Umschau" (Frankfort) is the author of a highly interesting article on "The Physiognomy of the Sick." The following excerpt indicates the value of his learned contribution: The question arises, by what means are we to arrive at a proper understanding of the physiognomy of the sick in case the facial expression incident to certain diseases is not in evidence. To decide this question it is necessary, first, to take into consideration the importance and weight of a critical opinion of the facial expression in health. Piderit's attempt to found a scientific system of mimicry and physiognomy —after Lavater's investigations became old-fashioned—is according to Henle, only a succès d'estime.

Various facial expressions obtain among the healthy. We are all cognizant of the following expressions: frightened, worried, pleading, happy, contemptuous, tired, fearful, studious, jovial, grinning, cheerful, wise, smiling, sickly, crafty, laughing, weak, morose, thoughtful, downcast, troubled, diffident, sly, horror-stricken, beatific, egoistic, sensuous, painful, astonished, stupid, agonized, sad, surprised, restless, changed, displeased, intelligent, disturbed and distorted. And there are others. In Proft's "Mimetic Physiognomic Studies," there are excellent photograms which illustrate no fewer than forty-eight different forms of mimetic facial expressions.

May we draw a conclusion from each illustration as to the permanent attributes of a certain individual? The definite answer to this query must be borrowed from the reply given by Henle to his own inclusive question as to how the mimetic facial expression is metamorphosed into a physiognomic one, that is, the process by which the mind acts on the nerves, the nerves on the muscles and the muscles on the superficial parts of the face, whereby permanent facial expressions of a peculiar nature are evolved, and permanent mental attributes may be studied. Henle, remembering the many mistakes in judgment that have been made by careful observers, arrives at the conclusion that to regard the study of physiognomy as a science is rather problematic. We must fully agree with Henle when he insists that instead of speaking of the facial expression of a certain individual, we should speak of its impression on us; in other words, we should inquire as to its somatic causes and not confine ourselves entirely to its physiologic meaning.

To ascertain whether the impression conveyed is the result of a mental process on the part of the individual, a further knowledge is necessary—a knowledge which can only be acquired by a closer acquaintance with the individual.

A generation has passed since these opinions of Henle on the subject of physiognomy were made public. Nevertheless they are today of the

same value as at that time if a consideration of the physiognomy of the sick is undertaken. If we have made greater strides as regards our knowledge of the physiognomy of the sick than as regards the physiognomy of the healthy, the reason for this is due to the fact that we do not limit our data to facial expressions but take into consideration a large number of other important points which have come to us from time immemorial.

It is undeniable that the physiognomy of the sick has always had other lessons for us than the physiognomy of the healthy. The former was never much assistance in the recognition of the psychologic importance of the facial expression, but was a great help in arriving at the thought that a facial expression could be the means of a clearer knowledge, on the part of the investigator, as regards the pathologic condition of the individual, and could be of decided value in making a prognosis as to the outcome of the disease.

While all this is a gain in so far as it is indicative of progress in connection with our understanding of the subject, undesirable errors are often made as the result of studying the connection between physiognomy and the attributes of character. About the most common illustration is the following. Among the masses the popular impression obtains that a fat person is invariably good-natured. If fact an expression of bonhomie seems to be part of this sort of face according to superficial observers. Poets have strengthened this belief—this myth—by many poetical allusions. Heinrich Heine in the "Harzreise" quotes Cervantes' saying: "He was stout, therefore he must have been a good man." Emile Augier in his comedy "La Cigué," says: "Virtue is fat; a bad man shuns food and drink." Cæsar must have regretted his wish: "Let me have men about me that are fat" when he flung "et tu, Brute" at the Roman, who though far from thin, was the ringleader of the mob that put him to death. Even today there is a great deal of truth in what Duncan in "Macbeth," says: "There's no art, to find the mind's construction in the face." Bodenstedt's lines:

> In every human face
> Lies written clear and plain
> The history of a life—its hatred and its love.
> And the secrets of the soul
> Are brought before our eyes—
> But few can read their meaning,
> But few can understand,

are only apparently a contradiction to Shakespeare's dictum. In reality, Bodenstedt's poem means that the subject cannot be mastered by everybody; to accomplish its mastery a natural talent combined with industry and many opportunities for study is necessary; otherwise the manifold phases of life cannot be understood.

Without these factors to illuminate the subject the greatest talent will come to naught. Just as occasionally the greatest painters miss out in some of their productions, so do the most thorough students of mankind

deceive themselves when arriving at conclusions. To arrive at the truth, an intimate knowledge of the subject is necessary.

I possess in common with other people the means of ascertaining an individual's character and emotional attributes from his physiognomy; that is, I am influenced by the opinion of his proved and trusty boon companions, who have watched his conduct and actions closely while students at the same gymnasium (high school). Although the designations, gamin-faced and jail-bird physiognomy, are known to many and on account of their daily use awaken among us hopes of a capacity on the part of the multitude as to diagnostic qualities in connection with the study of physiognomy, we know only too well that deep-dyed criminals have decidedly innocent faces; that the worst scoundrel may have the bland facial expression of the child; and that high-principled individuals look for all the world like criminals.

If the face of the healthy being yields but slight indications of his real character, the physiognomy of the sick, on the other hand, teaches a much better lesson. This can be readily understood because the latter is not dependent altogether on the facial expression but is helped and abetted by the changes in the color of the skin, the pallor or suffusion of the complexion, dietary conditions, bodily postures, the general appearance and by the normal functions of the different parts of the body.

Baumgärtner in his profusely illustrated book, "Physiognomy of the Sick," asserts that after studying the illustrations, not only will the student recognize their salient points in other faces but learn the cause of the slightest changes as they occur in the sick. Though this be the keynote of the work, I doubt if it is possible to diagnose a disease offhand, merely by examining the illustration depicting the patient's facial expression. This is not by any means due, in the majority of cases, to the technical difficulties incident to a faithful representation of the facial changes accompanying disease but, principally, to the impossibility of diagnosing the pathologic changes of the internal organs from the physiognomy as shown in a photograph. In the case of a likeness of an individual afflicted with nervous or mental disease, the difficulty of forming a diagnostic opinion is not so great. An insane person has an unchangeable as well as a typical facial expression.

In Charles Darwin's "The Expression of the Emotions in Man and Animals," the picture of an insane woman is given so that the condition of her hair may be shown. The way of wearing the hair is often so characteristic of the mentally afflicted that the following expression about startling coiffures has become current: "He (or she) wears his hair like a lunatic." In a number of nervous diseases one look at the face of the afflicted individual is all that is necessary to form a correct opinion of the nature of the disease.

HISTORICAL NOTES.

PETER PAAW AND THE ANATOMICAL THEATRE IN LEYDEN.

Peter Paaw, known by the Latin name of Pavius, was born in Amsterdam in 1564. From his earliest youth he applied himself diligently to his studies. In 1580 he was in Leyden, where he acquired an elementary knowledge of medicine under Bontius, John Heurnius and Rembert Dodoneus. Four years later he visited France, dividing his time between Paris and Orleans. In 1587, at the age of twenty-three years, he took the degree of Doctor of Medicine in the University of Rostock, and about this time he began publicly to teach anatomy. Desiring to acquire proficiency in this branch, he travelled into Italy and placed himself at the feet of the renowned Fabricius (of Aquapendens) in Padua. Paaw remained in Padua for three months, being called home by the death of his father. On his return to Holland, Paaw began the practice of medicine. In 1589 he was made Professor of Botany and Anatomy in Leyden and applied himself diligently to these branches for a period of twenty-eight years. He was one of the first men to cultivate these sciences in the University of Leyden. Although the bodies of criminals had been dissected in Holland since 1555 there was not an anatomical theatre in the country. The want was filled by Paaw, who, in 1589, erected a suitable building for the purpose of teaching practical anatomy. It is perhaps worthy of note that the first anatomical theatre in Paris was not built until 1604, although dissections had long been practiced in France.

The subject of this sketch was the author of several works on anatomy and of a treatise on botany, also of a dissertation on the plague. His works bear the following titles:

1—*Primitiae anatomicae de humani corporis ossibus.* Leyden, 1615, in -4; *Ibid.* 1638; Amsterdam, 1633.

2—*Andreae Vesalii epitome anatomica, opus redivivum cui accessere notae ac commentarii Petri Paaw.* Amsterdam, 1616, in -4; *Ibid.* 1633.

3—*Hortus publicus Academiae Lugduno-Batavae, ejus ichnographia, descriptio, usus; addito quas habet stirpium numero et nominibus.* Leyden, 1601, in -12; *Ibid.* 1603, in -8; *Ibid.* 1629, in -8.

4—*Succenturiatus anatomicus, continens commentaria in Hippocratem de capitis vulneribus; addita in aliquot capita libri viii Cornelii Celsi de positu et structura ossium explicatione.* Leyden, 1616, in -4.

5—*De valvula intestini epistolae duae.* Oppenheim, 1619, in -4.

6—*De peste tractatus, cum Henrici Florentii ad singula ejusdem tractatus capita additamentis.* Leyden, 1636, in -12.

In addition to the works mentioned above, some of Paaw's writings appeared in the *Observationes anatomica selectiores* of Thomas Bartholinus, which was published in 1657. Paaw left a book, *Methodus anatomica,* in manuscript.

Paaw's knowledge of osteology was extensive and his treatise on this subject is well written. To the anatomical description of the bones he has added some medical and surgical observations which make the reading both pleasant and useful. He recognized the bones to which the name of Wormius has been applied. Paaw described them as tiny bones hemmed in by certain sutures.

FIG. 1.—Anatomical Demonstration by Peter Paaw (Pavius) in Leyden in the year 1597. This was the first anatomical theatre erected in Holland. Engraving by Andreas Stog.

Portal[1] states that, among the authors of the seventeenth century, Paaw is one who theorized least but most accurately on the bones. He created a new conception of cranial fractures. Contre-coup, of which most surgeons were ignorant, was well understood by Paaw. He noted a special variety, stating: "I have seen a sad example resulting from a blow following an attack of apoplexy, which carried the patient off after a short time." He states that on opening the head he found the external plate of bone to be sound, and the internal plate fractured in several directions and bristling with splinters.

The early anatomists knew of the frontal sinuses. Paaw has improved upon their descriptions. He also gave an improved account of the Eustachian tube. His observations upon the maxillary sinus, on various articulations, and on ossification of cartilages, are all creditable.

The plates in Paaw's first book are mostly derived from those in the books of Vesalius and Bauhin.

In his dissertation on the valve of the colon, Paaw denied its existence.

The anatomical observations which are printed in connection with the work of Bartholin are deserving of notice. Paaw declares that the spinal cord is movable in its canal as is the brain within the cranium. He observed in a new-born babe a hernia of the brain in the temporal region; and in another subject he noticed a hernia of the cerebellum through the occipital bone. The latter subject had the testicles concealed in the lower abdominal cavity.

In 1598, while dissecting the body of a man, he observed the large pectoral muscle divided into two parts by a tendon.

An illustration of Paaw's anatomical theatre is found in his first book. The engraving was cut in copper by Andreas Stog from a painting by Jacob de Ghein. It is evident that the artist has taken the title-page of Vesalius's anatomy as his model.

The picture (Fig. 1) shows the anatomist at work, surrounded by about fifty men: knights, savants, peasants, and burghers, who can be differentiated by their clothes. Above all stands a skeleton holding a banner which bears this inscription: *Mors ultima linea rerum.*

Paaw's instruction seems to have been so interesting, and the crowds of students so large, that, in a few years a larger amphitheatre became necessary. Fig. 2., an engraving made in 1610 by Woudanus von Swanenburg, shows the Leyden anatomical theatre considerably enlarged and grotesquely ornamented. In place of one human skeleton, eight are here shown, of which six are holding banners with suitable inscriptions. Numerous skeletons of the lower animals are in evidence. In the background is a cabinet of instruments used in dissection. The whole picture suggests a room which combines a museum and an anatomical theatre.

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[1]Portal: Historie de l'Anatomie el de la Chirurgie, Paris, 1770, Vol. II., pages 398, 399.

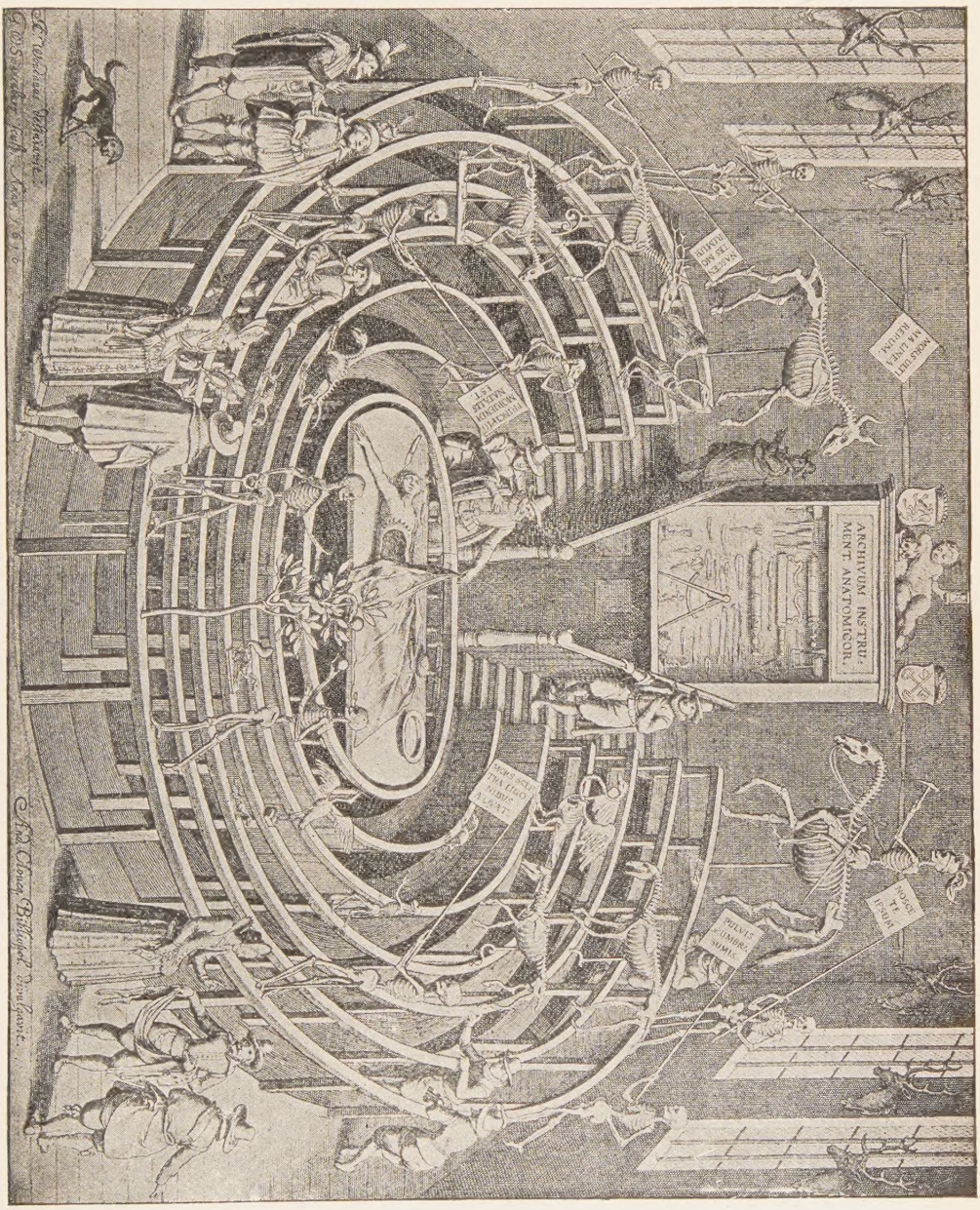

FIG. 2.—Anatomical Theatre in Leyden in the year 1610. Engraving by Woudanus von Swanenburg.

BOOK REVIEWS.

THE INTERNAL SECRETIONS AND THE PRINCIPLES OF MEDICINE. By Charles E. de M. Sajous, M. D., Fellow of the College of Physicians of Philadelphia; Member of the American Philosophical Society of the Academy of Natural Sciences of Philadelphia, etc.; Knight of the Legion of Honor and Officer of the Academy of France; Knight of the Order of Leopold of Belgium, etc.; Formerly Lecturer on Laryngology in Jefferson College and Professor of Laryngology and Dean of the Faculty in the Medico-Chirurgical College; Formerly Professor of Anatomy and Physiology in the Wagner Institute of Science. Volume Second. With twenty-five illustrations. Philadelphia: F. A. Davis Company, 1907.

The second volume of Sajous's work is a development of the conclusions advanced in the first volume, which appeared some years ago. The therapeutic applications of the doctrines advanced in the first volume are in it carried to their logical conclusions. Sajous's doctrine, in brief, is as follows: The chief of the internal secretions is derived from the adrenals, whose product is the oxidizing agent of the blood and contains a substance which preserves the vital activity of the cells. The thyroid secretion, too, is of great metabolic importance, as is shown in its relation to myxedema and hyperthyroidism. The ordinary theories of thyroid activity are, however, fallacious. The chief function of its secretion is to stimulate a center in the pituitary body. This organ, which he terms the somatic brain, is of the highest importance. Its function is to protect the body against disease. When stimulated either by thyroid activity or by the presence of toxins in the blood, the pituitary body produces a substance which, when carried to the adrenals, excites these organs to an over-production of their oxidizing principle. This in its turn causes the production of a hyperleucocytosis and stimulates the pancreas to an over-production of trypsin. These three agents, the oxidizing substance of the adrenals, the nucleoproteid produced by the leucocytes and the pancreatic trypsin, unite to form an auto-antitoxin which destroys the bacteria and their products. The opsonins, however, are derived from the thyroid. Ordinarily, the normal activity of these organs suffices to repel infection, but in disease they must be stimulated by drugs and other therapeutic measures.

Sajous's book is worth reading. It is based upon a careful study of the functions of the ductless glands and its conclusions are logically developed from his premises. It may be that future observations will confirm Sajous's views and render this an epoch-making work. As yet, however, it seems a little premature. Our knowledge of pathologic physiology is still in its infancy and it is quite possible that future discoveries will utterly destroy the very foundation upon which his conclusions are based. The book is interesting and worth perusing, but should be read with this reservation in mind.

BEITRAEGE ZUR KLINIK DER TUBERKULOSE. Herausgegeben von Dr. Ludolph Brauer. Bd. viii. Wuerzburg, A Stuber's Verlag (Curt Kabitzsch), 1907.

Volume VIII. of the Beitraege continues along the same lines as its predecessors. About half of the contributions are concerned with the clinical aspects of tuberculosis, the other half with laboratory questions. Among the interesting contributions may be mentioned two on the important forms of tubercle bacilli that are so little acid-fast that they can not be stained with the ordinary methods. They seem related to the bovine species and their presence is held to be of good omen prognostically. In a discussion of the diazo-reactions in tuberculosis, Weisz believes that he has found the responsible substance in a chromogen of urochrome. The volume is noteworthy for a nearly complete absence of all discussion of tuberculin, therapeutically and diagnostically, and the subject of opsonins is again conspicuous by its absence.

A LABORATORY MANUAL OF PHYSIOLOGICAL CHEMISTRY. By Elbert W. Rockwood, M. D., Ph. D., Professor of Chemistry and Toxicology and Head of the Department of Chemistry in the University of Iowa, etc. Second Edition, Revised and Enlarged. With One Colored Plate and Three Plates of

Microscopic Preparations. Large 12mo, 229 pages, extra cloth. Price, $1.00 net. F. A. Davis Company, Publishers, 1914 Cherry Street, Philadelphia, Pa.

A convenient little manual, chiefly intended for class-room work. The practitioner too will find it useful for handy reference as a supplement to his books on clinical chemistry and microscopy.

MANUAL OF PHYSIOLOGICAL AND CLINICAL CHEMISTRY. By Elias H. Bartley, B. S., M. D., Ph.G. Third Edition, Revised and Enlarged, with fifty-one illustrations. Phila.: P. Blakiston's Son & Co., 1907.

This little volume is a miracle of condensation. In it will be found concisely yet adequately described all the more significant chemical procedures utilized in clinical diagnosis. The discussion of milk analysis is especially complete.

CLINICAL TREATISES ON THE SYMPTOMATOLOGY AND DIAGNOSIS OF DISORDERS OF RESPIRATION AND CIRCULATION. By Prof. Edmund von Neusser, M. D. Translated by Andrew MacFarlane, M. D. Part I., Dyspnœa and Cyanosis. New York: E. B. Treat & Co., 1907.

There are three ways in which the study of disease may be approached: from the point of view of the etiology, from that of the laboratory findings, and from that of the symptomatology. It is the last method that Prof. von Neusser has chosen in his series of monographs. After a discussion of the nature of dyspnœa and cyanosis, he takes up one by one the conditions that may be responsible for these symptoms, and with keen analysis and a fund of clinical allusion makes clear the relation of symptom to disease. The succeeding volumes are to be on Tachycardia and Bradycardia and on Angina Pectoris.

PATHOLOGISCHE PHYSIOLOGIE. Ein Lehrbuch fuer Studierende und Aerzte. Von Dr. Ludolf Krehl, o. Professor und Direktor der medizinischen Klinik in Heidelberg. Mit einem Beitrag von Professor E. Levy in Strassburg. Fuenfte neu bearbeitete Auflage. Leipzig: Verlag von F. C. W. Vogel, 1907.

With a few shining exceptions, practically all of our medical schools show a very grave omission in their laboratory curriculum. The study of the normal human body is well represented in its static and kinetic aspect by anatomy and physiology. The diseased organism is, however, ordinarily studied, in courses on pathologic anatomy only from the point of view of the ultimate effects of disease. The study of the metabolic processes of disease is comparatively neglected, or at least taught only in a didactic manner. And yet pathologic physiology concerns the practicing physician more intimately than any of the other great divisions of medical study. In Krehl's book an attempt is made to fill this gap. In general, the structure of the book is that of most physiologies. Circulation, respiration, digestion and so forth are taken up in turn, but a knowledge of their physiology is assumed and the changes in function arising from disease are discussed with great thoroughness. Gaps in the presentation are of course inevitable. Our knowledge of pathologic physiology, being comparatively recent, is even more incomplete than that of normal physiology, and everywhere we are brought up against the confines of the known. Nevertheless, the matter here presented, objectively and with a minimum of theorizing speculation, must be of the greatest interest and importance to every clinician. The book can be unreservedly commended, and it is to be hoped that before long an adequate English translation will unlock its treasures to those who are unable to read it in the original.

DIE THIERISCHEN PARASITEN DES MENSCHEN. Ein Handbuch fuer Studierende und Aerzte von Dr. Max Braun, o. œ. Professor der Zoologie und vergl. Anatomie des zoologischen Museums der Universitæt Kœnigsberg i. Pr. Mit 325 Abbildungen im Text. Vierte, vermehrte und verbesserte Auflage. Mit einem klinisch-therapeutischen Anhang bearbeitet von Prof. Dr. Otto Seifert in Wuerzburg. Wuerzburg: Curt Kabitzsch (A. Stuber's Verlag), 1908.

After a discussion of parasitism in general in its various aspects, the author describes in detail all the known human animal parasites. The subject is handled from the purely zoologic point of view, the protozoa, helminthes, nematodes, acanthocephali, gordiidæ, hirudinei and arthropods undergoing a detailed description in turn. Few of them have clinical significance, the great bulk being purely of zoologic interest and some, such as the leeches, being parasites in only the widest interpretation of the term. In connection with the human parasites, similar ones peculiar to the lower animals are also described, so that the volume might well be called "The Parasites of Mammals" rather than merely "of Man."

A characteristic feature of the book is a refreshing scepticism. Without this, the very nature of the subject would lead the author into a wilderness of specu-

lation. Many widely accepted views are dismissed, with a brief "not proven." Thus he declines to accept the spirochæte pallida of syphilis as a protozoon, while not committing himself to its bacterial nature. The cytorrhyctes of vaccine, syphilis and the like are described, but the possibility of their being mere degeneration products is emphasized. In a word, the reader will find here a complete, but cautious and conservative presentation of the subject. In an appendix, Prof. Seiffert discusses the clinical picture, the prevention and the treatment of diseases due to animal parasites. As was proper, he confines himself to diseases of human beings.

RATIONAL HOME GYMNASTICS. By Hartvig Nissen, Director of Physical Training, Brookline Public Schools; Instructor in Swedish Gymnastics and Massage at Harvard University Summer School, etc. E. H. Bacon & Co., 8 Beacon Street, Boston, Publishers.

In this work the author presents his method of teaching gymnastics in the various institutions with which he is connected. The instructions are particularly adapted for exercises in the home. The book contains many useful suggestions for exercises in various pathologic conditions.

THERAPEUTISCHES TASCHENBUCH FUER HAUT UND GESCHLECHTSKRANKHEITEN. By Dr. Alfred Blaschko und Dr. Max Jacobsohn in Berlin. Verlag von Fischer's Mediz. Buchhandlung in Berlin. Preis, Mk. 2.80.

Two eminent German dermatologists and genitourinary surgeons, Drs. Blaschko and Jacobsohn, of Berlin, in this little book, give an outline of the treatment carried on for years in their private practice and clinical work. They only mention what has proved to them to be of great value in the treatment of diseases of the skin and of genitourinary diseases, and this fact makes the book worth having. The arrangements of the diseases in alphabetical order and the book being interleaved, make it the more handy for use.

HAND-BOOK OF CUTANEOUS THERAPEUTICS FOR THE USE OF GENERAL PRACTITIONERS. By W. A. Hardaway, M. D., LL.D., and Joseph Grindon, Ph.B., M. D. Lea Brothers & Co., Philadelphia and New York.

It is with great pleasure that we receive this first American hand-book of cutaneous therapeutics. Drs. Hardaway and Grindon have done a good work in writing this book, which should be in the hands not only of general practitioners, but of specialists as well. A short but clear description of every disease, sometimes completed by a few practical remarks on symptomatology and etiology, precedes the therapy. The latter gives us first the personal experience of the authors, in which we feel all the time the masterhand of Dr. Hardaway, the "Father of Dermatology in the West," who gives us an enormous amount of practical points that are of value to every one who treats diseases of the skin. Not only do we find here the way the authors most often treat their cases, but they also mention very extensively the methods used by other dermatologists the world over, giving due credit to all of them.

In the second part of the book general treatment and methods find a place. This part, written by Dr. Grindon, gives a brief description of internal treatment and local applications without going deeply into the theories on which general treatment is based. Special sections are devoted to radiotherapy, the high frequency current, galvanism, faradism, minor surgical operations, and the latest methods of treatment, as Hollaender's hot air treatment, Bier's hyperemia, the treatment with liquid air and solidified carbon diaxide.

A TEXT-BOOK OF CLINICAL ANATOMY: FOR STUDENTS AND PRACTITIONERS. By Daniel N. Eisendrath, A. B., M. D., Clinical Professor of Anatomy in the Medical Department of the University of Illinois (College of Physicians and Surgeons), Chicago. Second Revised Edition. Octavo of 535 pages, with 153 illustrations, a number in colors. Philadelphia and London: W. B. Saunders Company, 1907. Cloth, $5.00 net; Half Morocco, $6.50 net.

Some years ago we received and reviewed the first edition of this work, and have had occasion many times since to refer to the excellent text and well selected drawings. The book was primarily meant as an aid to the author in teaching his students the relation of descriptive anatomy to clinical practice, but it has proved a valuable reference book for the practitioner, and will be a good addition to most medical libraries.